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CONTENTS

Agronomy (Crops and Soils) 6036–6132
Bibliography, Biography and History 6133–6165
Botanical Education 6166–6169
Cytology 6170–6176
Ecology and Plant Geography 6177–6222
Forest Botany and Forestry 6223–6291
Genetics 6292–6318
Horticulture 6319–6370
Morphology, Anatomy and Histology of Vascular Plants 6371–6408
Morphology and Taxonomy of Algae 6409–6436
Morphology and Taxonomy of Bryophytes ..... p. 978
Morphology and Taxonomy of Fungi, Lichens, Bacteria and Myxomycetes 6437–6466
Paleobotany and Evolutionary History 6467–6497
Pathology 6498–6599
Pharmaceutical Botany and Pharmacognosy 6600–6613
Physiology 6614–6690
Taxonomy of Vascular Plants 6691–6805
Miscellaneous, Unclassified Publications 6806–6810

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UNDER THE DIRECTION OF

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J. R. SCHRAMM, Editor-in-Chief

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Vol. 14 JULY, 1925 No. 7

ENTRIES 6036-6810

AGRONOMY (CROPS AND SOILS)

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(See also in this issue Entries 6138, 6181, 6186, 6303, 6304, 6370, 6373, 6388, 6389, 6566, 6583, 6606, 6614, 6638, 6652, 6676, 6677, 6678, 6685, 6716, 6717, 6782)

CROP SCIENCE (ARVICULTURE)

6036. ANONYMOUS. **A new use for rubber. The preservation of fruits.** Tropic. Agriculturist 64: 62. 1925.—This article quotes (Bull. Soc. Nation. d' Acclimatation) published results of an experiment by D. J. Cramer, Director of the Plant Breeding Station, Buitenzorg, Java, who sought a practical method for facilitating the export to Europe of certain tropical fruits, other than bananas and pine-apples. The Cramer method is as follows: "The fruits which are gathered a little before they are ripe are coated with a thin layer of rubber latex, which on coagulating forms a protective cover around the fruit. The changes attending the ripening of the fruit are thus retarded. The fruit is also to a great extent protected against organisms which bring about the decay of vegetable matter. In order to test his method Dr. Cramer has just sent to the Laboratoire d'Agronomie Coloniale a very interesting consignment of mangosteens (*Garcinia Mangostana* L.) This consignment arrived on the 1st of December last after a voyage of about a month, brought over by a collaborator of Dr. Cramer's in a small case which he kept in his cabin. The mangosteens were covered with a thin film of rubber and each fruit was wrapped in a piece of greased paper. Sixty per cent of the fruit was in perfect condition; the pericarp had assumed the violaceous tint that is usual in the ripe fruit, and had become slightly soft under the pressure of the finger. On opening it for extracting the pulp, it is noticed that this pulp has the same freshness and the same flavour as that of fruit recently gathered."—*H. N. Vinall.*

6037. ANONYMOUS. **Cotton growing in Argentina.** Amer. Fertilizer 61[1]: 42–44. 1924.—This brief article records the observations of a party of foreign commercial men and members of the American, German and Japanese Embassies who, as guests of the Argentine State Railways, visited the cotton growing districts of Argentina, where this crop has been grown for

46480

nearly 300 years. The discussion covers cotton growing in the "Gran Chaco," yields obtained, costs of production, labor employed, and estimated acreage.—*Frederick V. Rand.*

6038. Anonymous. **Neue Arbeitsweisen in der Futterrübenzüchtung. [New methods in turnip culture.]** Wiener Landw. Zeitg. 73: 418. 1923.—This is a brief account of measurements of the sugar content of a number of varieties of turnip, made with an ordinary polimeter and a new Goerz refractometer with a sugar scale.—*F. Weiss.*

6039. Anonymous. **Treatment of seed potatoes with nitrate of soda.** Agric. Gaz. New South Wales 36: 92. 1925.—Treatment of seed tubers as indicated did not result in increased yields, probably due to rotting brought about by treatment.—*L. R. Waldron.*

6040. Ainsworth-Davis, J. R. **The principles of agriculture.** *xiv + 261 p. Illus.* Methuen & Co. Ltd.: London, 1924.—This book, which is one of a series published by the Methuen Company on agricultural topics, is somewhat original in its method of treatment, although the material is not new. The basic principles of plant and animal life which are usually available only in botanies and physiologies are explained in simple language and illustrated with numerous diagrams so that readers who are not college-trained can easily understand them. The book discusses in this way the morphology, reproduction and classification of plants, including flowering plants, bacteria and fungi; the structure, metabolism and classification of animals even to simple forms like the protozoa; diseases and insect enemies; geology with special reference to the origin of different soils and the principles of manuring.—*H. N. Vinall.*

6041. Åkerman, Å. **Undersökninger rörande våra höstsädesorters vinterhärdighet. [Investigations on winter hardiness of Swedish winter grain varieties.]** Nordisk Jordbrugsforskning 1923: 489–512. 1923.—Testing for winter hardiness is difficult in southern Sweden because of the unequal severity of the winter. For wheat the danger of freezing (possibly followed by drying) and for rye the snow mold (*Fusarium*) are most to be feared. Based upon field experiments, wheat varieties have been grouped in 10 classes according to hardiness, and by means of freezing point-determination, the classification has been investigated further in the laboratory. It was found then that a very distinct correlation exists between hardiness and sugar content. It is known that following hybridization the degree of hardiness shows segregation. Relative sugar content segregates in the same way. For rye similar correlation exists between hardiness and sugar content. In Danish experiments, correlations of dry matter and sugar content with hardiness of beets has been demonstrated.—*Ernst Gram.*

6042. Atkinson, Esmond. **Weeds and their identification: barnyard grass.** New Zealand Jour. Agric. 29: 409–412. *2 fig.* 1924.—*Panicum crus-galli* L. is described. This relative of the millets which is widely distributed in New Zealand, is essentially a summer annual weed of roadsides and cultivated ground. Several forms are recognized. One, Japanese millet, is often cultivated and is superior in forage value to the more weedy forms. Although sometimes troublesome, particularly during hot seasons, the plant succombs readily to ordinary cultivation methods.—*M. W. Talbot.*

6043. Barratt, T. **Measurement of breaking stresses, extensibilities and elasticities of single fibres of cotton, etc.** (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 13: T 17–24. *Fig. 1–6.* 1922.—Methods and apparatus previously used are discussed. None of them exactly suiting the purpose, an apparatus was constructed by the author which is described and tests with it are detailed.—*Frederick V. Rand.*

6044. Bois, D., and J. Gerome. **Essais de culture quelques variétés de Soja au Jardin d'expériences du Muséum, en 1921. [Experiments in soybean culture.]** Bull. Mus. Hist. Nat. [Paris] 28: 322–328. 1922.—This article records the results of attempts to raise in the experimental garden of the Museum a series of 23 varieties of soybeans received from the U. S. Dept. of Agric. Of these only 7 ripened their seed quickly enough to permit of their being of economic value in the region of Paris. Several European varieties, similarly cultivated, proved better adapted to this region. A set of tables is included which gives the data concerning culture conditions, yield, etc.—*John M. Fogg, Jr.*

6045. Bondorff, K. A. **Er sukkerroeudbyttet paa Lolland-Falster dalende? [Is the sugar-beet harvest on Lolland-Falster decreasing?]** Ugerskr. Landmaend 69: 759–761. 1924.—In the last 20 years the gross weight of sugar beets per unit area has decreased 25%.

This is partly due to breeding for higher sugar percentage, to poorer work in thinning and hoeing, to higher percentage of soil clinging to the roots, and to attacks of the beet leaf-miner (*Pegomyia hyoscyami*). Root rots, connected with lack of liming, and other diseases may locally cause heavy losses. A specific "soil sickness," in which the soil becomes "tired" of sugar beets, is probably not present since the causes mentioned account fully for the reduction in yield.—*Ernst Gram.*

6046. Bondorff, K. A. **Om Podning af Humleagtig Sneglebælg. [Inoculation of Medicago lupulina.]** Ugeskr. Landmaend 69: 254–255. 1924.—In different parts of Denmark (1922) some experiments were conducted in which *Medicago lupulina* was sown with and without inoculation with nodule bacteria. The effect was measured by the weight of the succeeding crop produced on the plots. The results varied greatly; in 3 experiments the inoculation gave a distinctly higher weight, while in 2 other tests the effect of inoculation seemed to be injurious. These results cannot be as yet finally explained.—*Ernst Gram.*

6047. Borthwick, H. A. **Factors influencing the rate of germination of the seed of Asparagus officinalis.** California Agric. Exp. Sta. Tech. Paper 18: 1–17. 1925.—Asparagus seed were soaked in water at temperatures ranging from 10 to 50°C., and for different periods of time. Results are given showing the rate of water intake, and the rate of germination of the soaked seed in the laboratory and in the field. The author recommends a period of soaking of 3–5 days at 30–35°C. as safe and practical. A brief bibliography is given.—*Margaret Buvens.*

6048. Bunting, B. **Colombian pita fibre.** Malayan Agric. Jour. 12: 185–190. 1924.—Various introductions of "pita" fiber have recently been made from South America into the Malay Peninsula. In this paper the plant and its cultivation are described, with an account of what is known concerning the extraction, yield and uses of the fiber. It is not yet certain whether the plant will prove a commercial success in Malaya.—*R. E. Holttum.*

6049. Carrier, Lyman. **The vegetative methods of planting creeping bent.** Bull. Green Section U. S. Golf Assoc. 4: 54–60. 1924.—The new method of propagating turf of creeping grasses, especially creeping bent, by clonal reproduction rather than by sowing the seed, is described in detail. The process consists essentially of scattering short pieces of stolons on a well-prepared seedbed, covering them immediately with a thin layer of soil and rolling lightly. Careful watering for the next 2 or 3 weeks, to keep the soil continually moist, is very important. —*L. W. Kephart.*

6050. Christie, W. **Resultater af norsk forædlingsarbejde med kornarterne. [Results of breeding of Norwegian grain varieties.]** Norsisk Jordbrugsforskning 1923: 535–547. 1923. —The wide extension of Norway from south to north and the varying altitudes create widely differing conditions for grain culture. Many foreign varieties have been in use, but old local varieties have frequently proved the best and have formed a basis for breeding, mostly at Møistad, the State Exp. Sta. of Hedmark. Of the new oat varieties, Møistad Thor, Møistad Odin, Møistad Grenader, Perle and Kost are promising. Of barley varieties, Bamse, Finnegut, Møistad Mjøs and Møistad Maskinbyg are of value for one or more provinces. The breeding work is being continued and spring wheat has been recently taken up with promising results.—*Ernst Gram.*

6051. Clayton, E. S. **Maize experiments in the southern district.** Agric. Gaz. New South Wales 36: 98. 1925.—Trials with maize were conducted upon 2 private farms. The maximum yield was secured from Funk's Yellow Dent at Tumut.—*L. R. Waldron.*

6052. Cox, Joseph Frank. **Crop production and soil management.** *1st ed. xxx + 516 p. 222 fig.* John Wiley & Sons, Inc.: New York, 1925.—This volume is intended as a handbook for students and farmers. Part I deals with "Operations" under such headings as choice of varieties, selection of seed, preparation and maintenance of soil, planting, control of pests and harvesting.—Part II details the operations of growing corn, wheat, oats, rye, barley, buckwheat, flax, sorghums, potatoes, sugar-beets, cabbage, field beans, soybeans, clover, alfalfa, sweet clover, grasses and emergency forage crops. Suggestions for field studies conclude each chapter. A separate chapter is devoted to crop exhibits and judging contests.—*L. W. Kephart.*

6053. Dalgliesh, C. S. **Pastures at Waimaunga Experimental Farm.** New Zealand Jour. Agric. 29: 208–209. 1924.—Briefly summarizing the pasture situation at the Waimaunga Experimental Farm, the author states that from his observations on farms throughout this

coast region, temporary pastures should be limited to areas for the providing of the necessary bulk of feed at the required time. Such pastures provide a supply of excellent feed for the first 2 years, but the number of open spaces that appear permit moss, weeds and inferior grasses to establish themselves. Permanent grass pastures will not yield the same bulk of feed for the 1st year or so, but will give a more consistent supply throughout the year, forming a closer sward of pasture and preventing moss and inferior grasses from flourishing.—*Mary R. Burr.*

6054. De Wildeman, É. **Agriculture des indigènes et Agriculture capitaliste aux Colonies.** [Native and capitalist agriculture in the colonies.] Ann. Soc. Sci. Bruxelles 43: 397–401. 1924.—Certain considerations concerning the publication of Willis' book on "Agriculture in the tropics" are discussed. This elementary treatise was published in London in 1922. —*Author (translated).*

6055. Elofson, A. **Græsmarkskulturen såsom produktionsfaktor i det moderna jordbruket.** [Grass-land as a productive factor in modern farming.] Nordisk Jordbrugsforskning 1923: 32–43. 1923.—Efficient pasturing is very profitable and holds unparalleled possibilities for Swedish agriculture. Sweden has an area of high grass-land amounting to 1,360,000 ha. and of meadow, 930,000 ha., most of which is used for hay production. To this must be added about 1 million ha. of pasture, partly mixed with forest. The yields from these areas can be increased and the production of albuminous fodder on the pasture can compete with any other crop in Scandinavia. Drainage, addition of desirable grass varieties and proper fertilizing are the main conditions for improvement. The fertilizing exerts a great influence on the botanical and chemical composition of the grass carpet and thus on the quality of the fodder. All-round fertilizing protects against winter-injury.—*Ernst Gram.*

6056. Erhard-Frederiksen, V. **Stokløbere i Sukkerroemarken.** [Annuals in the sugar beet fields.] Ugeskr. Landmaend 68: 634–639. 1923.—The tendency towards shooting seed stalks is an inherited characteristic which may be greatly influenced by the effect of climatic conditions. Experiments with Danish sugar beet seed have afforded very satisfactory results, but in 1923 cold periods and corresponding low soil temperatures following seeding caused a very extended shooting of adventitious seed stalks in the Danish beet fields. It is considered probable that this was increased by the poor quality of the 1922 seed crop. It is to be expected that the extended shooting in 1923 will be utilized by the seed breeders to rogue in order to eliminate this tendency. (This is apparently related to the growing of beets for the production of sugar beet seed.)—*Ernst Gram.*

6057. Fitts, O. B. **A preliminary study of the root growth of fine grasses under turf conditions.** Bull. Green Section U. S. Golf Assoc. 5: 58–62. 1925.—A duplicate series of 8 woven wire cages, 1 cu. foot in volume, was filled with layers of loam and sand compost in various combinations to imitate different methods of preparing a seed bed for turf. Bent grass stolons were planted in each cage in April 1923. One year later the soil was washed from the rows of 1 series. The following October the remaining series was washed. It was found that during the winter the grass in all of the cages had developed deep roots whereas the summer root growth in all cases was short and compact. The character and arrangement of the soil had no effect on this behavior. The soil did, however, affect the quality of the turf, the best turf appearing on natural garden loam and the poorest turf on 12 inches of sand. The writer concludes that there is no object in preparing elaborate, deep seedbeds for turf but that the use of ordinary loam followed by proper surface fertilizing will produce the highest quality of sod.—*L. W. Kephart.*

6058. Gaardman, P. N. **Stokløbere i Roemarken.** [Adventitious seed stalks in root crops.] Ugeskr. Landmaend 68: 438–439. 1923.—Root crops exhibit a tendency to shoot adventitious seed stalks when early seeding is practised and seeding is followed by abnormally cool periods. In 1923, mangolds, sugar beets, fodder-sugarbeets and turnips were sown at intervals and it was noted that the number of seed stalks decreased to a marked extent corresponding regularly to the interval of delay in sowing. Earlier experiments have shown that it pays to cut or break the (young) seed stalks, as this results in a more nearly normal development of the root and avoids the over-shadowing of neighboring plants.—*Ernst Gram.*

6059. Gaardmand, P. N. **Stokløbere i Roemarken.** [Seed stalks in beets.] Ugerskr. Landmaend 68: 723–724. 1923.—Experiments were conducted in fields of pink fodder-sugar

beets, 25% of which bore (adventitious) seed stalks. From each of 6 plats the stalks were cut twice, during the 1st days of August and of September; 6 other plats were left uncut. The beets from which the stalks had been cut afforded a yield of 60 tons of roots per ha. and the uncut ones 55 tons; the percentage of dry material in the roots was practically identical. About 60% of the loss is due to the low weight of the roots from beets bearing seed stalks and 40% to the injurious effect of over-shadowing of neighboring (normal) plants.—*Ernst Gram.*

6060. GÉRÔME, J. **Essais de culture de pomme de terre au Muséum.** [Potato culture experiments at the Museum.] Bull. Mus. Hist. Nat. [Paris] 28: 111–116. *Fig. 1.* 1922.—This article is a record of the results obtained by the propagation of potatoes from shoot-cuttings bearing no tubers and by planting partly germinated tubers. The harvests are compared with those resulting from the ordinary method of seed-piece propagation. Data are brought together in a table.—*John M. Fogg, Jr.*

6061. GREVE, M. **Plantaevlsarbejdets Udvikling i Københavns Amt.** [The development of the plant culture movement in Copenhagen county.] *64 p. 12 portraits.* Lyngby, 1924.—This article is a brief historical account of the work in Copenhagen County, including the 1st Danish "local plant board," local fertilizer experiments, the 1st county agent, disease and weed control experiments, hot-water disinfection, seed distribution, and systematic soil investigations.—*Ernst Gram.*

6062. GREVE, M. **Systematiske Undersøgelser auf Lucernemarker.** [Systematic survey of alfalfa fields.] Ugeskr. Landmaend 69: 785–786. 1924.—A local plant culture board has surveyed 7 townships near Copenhagen. The alfalfa covered 2–4% of the total area of 383 farms, but only 104 farms actually cultivated alfalfa, and of their area 6.6% were occupied by this crop. The culture is more common on large farms, the average area of farms with alfalfa being 28 ha. and of farms without, 18 ha. The cool, moist summers of 1922 and 1923 have clearly shown the importance of good drainage; the following extremely severe winter (1923–1924) damaged many fields. A few fields where the seed was not inoculated with nodule bacteria were very poor. Failure may be due also to acid soil reaction, lack of potassium and phosphate fertilizers, too vigorous harrowing, and cutting so late that the alfalfa is given no time for renewal of growth before winter.—*Ernst Gram.*

6063. HANSEN, H. **Vegrforholdene i Lanbrugsaaret.** [Influence of weather on agriculture.] Tidsskr. Landøkonomi 12: 601–620. 1924.—Statistics are presented to show the influence of the weather on agricultural production during 1923–1924.—*Albert A. Hansen.*

6064. HARDENBURG, E. V. **Muck and peat soils for potato production.** Potato News Bull. 1: 324–325. 1924.—Experiments in the culture of potatoes on 6 soil types in 3 counties in New York State have shown that: Muck-grown potatoes when used for seed will yield as well as upland-grown seed; muck-grown seed sprouts earlier than upland seed; potatoes grown on light or muck soils set a larger number of tubers than those grown on heavy soils; muck-grown potatoes are equal in starch content, texture and color of flesh to upland potatoes.—*F. Weiss.*

6065. HERTEL, H. **Landbruget i 1924.** [Agriculture during 1924.] Tidsskr. Landøkonomi 1925: 1–39. 1925.—This is a survey of the political, financial and production aspects of European agriculture during 1924.—*Albert A. Hansen.*

6066. HUTCHESON, T. B., AND T. K. WOLFE. **Lime and its relation to crop production in Virginia.** Virginia Agric. Exp. Sta. Bull. 237. *1-20. 4 fig.* 1924.—A general discussion is given of the use of lime in crop production, with details of experimental-plot work with corn, wheat, hay, cotton, peanuts, and tobacco.—*F. D. Fromme.*

6067. JACK, H. W., R. O. BISHOP, AND J. N. MILSUM. **Sisal hemp.** Malayan Agric. Jour. 12: 352–370. 1924.—Sisal hemp (*Agave sisalana*) has been successfully cultivated in the Malay Peninsula. A general account of the plant, its cultivation and products is given, with details of the yield and quality of locally produced fiber.—*R. E. Holttum.*

6068. JØRGENSEN, C. O. **Er Almindelig Rajgræs (Lolium perenne) tilstrækklig haardfør og modstandsdygtig i vort Klima?** [Is Lolium perenne hardy and resistant enough for our climate?] Nordisk Jordbrugsforskning 1924: 411–417. 1924.—In Denmark, during the severe winter, 1923–1924, rye-grass was killed by snow-mold. While prominent in the English and German pastures, rye-grass is not considered reliable in Sweden. Where the amount of dead plant material which serves as a substrate for the Fusaria is smaller, as in the 1st-year pastures, the snow-mold injury was less important.—*Ernst Gram.*

6069. Jørgensen, K. A. **Tyve Aar i Forsøgsmarken. 11: Hundegræs, 12: Hestebønne, 13: Sneglebælg, 13 (sic): Rundbælg.** [Twenty years in the experiment field. 11: Dactylis glomerata, 12: Vicia faba, 13: Medicago falcata, 14: Anthyllis vulneraria.] Tidsskr. Frøavl 12: 822–829, 835–840, 852–855, 871–875. 1924.—An historical account is presented of the culture and breeding of the plants listed as occurring in Denmark.—*Ernst Gram.*

6070. Kennedy, Don F. **Yarrow as a putting turf.** Bull. Green Section U. S. Golf Assoc. 5:39–40. 1925.—This article reports the successful use of *Achillea millefolium* for fine turf.—*L. W. Kephart.*

6071. Knollin, James C. **A large potato yield.** Potato News Bull. 1: 349–353. 1924.—A surveyed acre in San Joaquin County, California, yielded 57,752.75 pounds, and 4 acres yielded an average of 56,240.21 pounds equivalent, respectively, to 962½ and 937 bushels. The variety was Russet Burbank. Comparison is made with what is believed to be the British record for potato production of 896 bushels on 1 acre. The details of soil preparation and culture are given.—In a footnote Stuart calls attention to a larger authenticated yield of 974.8 bushels on a measured acre in Wyoming in 1890.—*F. Weiss.*

6072. Lambourne, J. **A preliminary report on carpet grass.** Malayan Agric. Jour. 12: 402–403. 1924.—*Axonopus compressus* has been introduced from America, and appears likely to be useful. Details of its habit of growth and cultivation are given.—*R. E. Holttum.*

6073. Lawaetz, H. **Stokløberne i Sukkerroemarken.** [Seed stalks in sugar beet fields.] Ugeskr. Landmaend 68: 703–704. 1923.—In 1923 adventitious seed stalks were very prevalent in the Danish sugar beet fields and offered a very good opportunity for roguing for the elimination of this tendency. The effect of removal of the seed stalks was experimentally ascertained by cutting them at their bases. Beets on which the stalks were permitted to grow yielded 26% less gross weight of roots than normal beets, whereas those from which the stalks had been cut yielded only 3.1% less than normal beets. The cutting must be done early in order to make it profitable with regard to the affected beets, and, with regard to neighboring beets, in order to avoid the detrimental effect of overshadowing by the seed stalks.—*Ernst Gram.*

6074. Leach, Charles F. **The acid soil legumes.** Florida Grower 31[7]: 8. 1925.—The kudzu vine and cherokee clover are recomended for acid soils in Florida. Cherokee alone is very sweet and palatable, will make a crop of hay in 60 to 70 days and mature its seed in 90 days.—*J. C. Th. Uphof.*

6075. Lende-Njaa, J. **Forslag til metode for bestandsundersøkelser paa eng og beitemark.** [A proposed method for population surveys on meadow and pasture.] Nordisk Jordbrugsforskning 1923: 415–433. 1923.

6076. Lundegardh, H. **Markens naturlige kolsyreproduktion och dess betydelse för gödsellären.** [The natural production of carbon dioxide in soil and its importance for the theory of fertilization.] Nordisk Jordbrugsforskning 1923: 311–328. 1923.—Aside from the more acid soils, in which fungi produce considerable amounts, the production of carbon dioxide is a measure of bacterial life, but it supplies no basis for determining the forms involved. Two years field experiments with oats, cabbage, and potatoes actually show the plant production to be in a certain relation to the CO_2 production or the CO_2 content of the air around the plants. A laboratory method for investigating the influence of different nutritive elements on CO_2 production in soil samples is briefly outlined. There appears to be no correlation between humus content and CO_2 production, the amounts of available nutritive elements together with texture and moisture being of dominating importance. Barnyard manure and artificial fertilizers have similar effects on the production of CO_2. The CO_2 production is of some value for the estimation of lime requirement.—*Ernst Gram.*

6077. Lutman, Anna S. **Agricultural seed inspection.** Vermont Agric. Exp. Sta. Bull. 233. *1–8.* 1923.—Analyses are given of agricultural seed on the market in Vermont during 1923.—*G. P. Burns.*

6078. Lutman, Anna S. **Agricultural seed inspection.** Vermont Agric. Exp. Sta. Bull. 241. *1–7.* 1924.—Results of analyses of agricultural seed sold in Vermont in 1924 are presented.—*George P. Burns.*

6079. McDonald, A. H. E., et al. **Crop-growing competitions, 1924.** Agric. Gaz. New South Wales 36: 1–26. *1 fig.* 1925.—Crop-growing competitions conducted in 40 localities are

discussed. By use of the score card method, crops are judged in the field on the basis of estimated yield, type and purity, freedom from disease, evenness, cleanliness, and condition and appearance. Results indicate rather clearly that these competitions have resulted in improved methods of farming in the districts where they have been carried on for some time. In certain localities they are still somewhat of a novelty. In 1 district with a radius of less than 30 miles, 21 wheat varieties were grown in the competitions, indicating the diversity of varieties used in New South Wales. Most of the competitors applied superphosphate to the crops, the average amount being somewhat over 50 pounds per acre. The rate of seeding varied from 30 to 70 pounds, the average being somewhat less than 60 pounds. It has been found that dry treatment for bunt has made possible the use of 5 pounds less of seed per acre. Detailed results of awards are given.—*L. R. Waldron.*

6080. Matlack, Shelton S. **Making arrow-root starch.** Florida Grower 31[5]: 7. 1925.—The Florida arrow-root is derived from *Zamia integrifolia* and the plant grows wild on pineland. The area between Fort Lauderdale and Miami would be sufficient to support several factories but for the fact that ground can be gone over only once every 6 years. A portion of the root must be left in the ground, and this continues to grow until the harvesters return later and dig it, if it has reached sufficient size. The roots were dug by the Indians and ground between rocks, the starch flour thus produced being either made into bread or cooked and eaten in some other form. It is still in great favor with the Seminole Indians. This arrow-root industry is more or less firmly bound up with the early history of Miami and vicinity. In the early days it was shipped to Key West by schooner where it was bought by representatives of New York firms. Now after the roots are taken from the ground they are thoroughly washed by machinery and then shredded and ground by steam power. The pulp thus produced is pumped through successive tanks and along setting trays, allowing the starch to separate from the water and waste. The starch, being heavy, quickly goes to the bottom. The average starch content in a root is 12–18%. Hydrocyanic acid is also present.—*J. C. Th. Uphof.*

6081. Mayr, E. **Getreidebau und Getreidesorten im salzburgischen Salzachtal.** [**Agricultural and grain varieties in the Salzach Valley.**] Mez, Bot. Archiv. 8: 185–223. *33 fig.* 1924.—In the Salzach Valley (Austria) local varieties of grain have been used for ages and have taken on characteristic properties. This paper is the first attempt to analyse these varieties, to determine their distribution and by reference to the biological varietal characters to secure an insight into varietal relationships.—*Carl Mez (transl. and abridged by William Seifriz).*

6082. Miller, Adam. **The classification of varieties of the potato. Field demonstration.** Potato News Bull. 1: 286–288. 1924.—This is an abstract of a paper read at the potato conference held at Edinburgh, August 20, 1924. A key to the classification of varieties of potato, in which the major divisions are based on season, color of sprout, color of skin, shape of tuber and color of flower, is given.—*F. Weiss.*

6083. Milsum, J. N. **Fodder and grazing grasses in Malaya.** Malayan Agric. Jour. 12: 394–401. 1924.—The present practices as to cattle feeding in Malaya are discussed. Satisfactory results have been obtained with the cultivation of *Panicum maximum* as a fodder; experiments with *Panicum muticum* and *Pennisetum purpureum* are in progress. The question of establishing pastures is under trial; notes are given on *Paspalum dilatatum* and *Axonopus compressus*, which appear promising.—*R. E. Holttum.*

6084. Münzberg, H. **Anbauversuche mit verschiedenen Lupinensorten.** [**Culture tests with lupine varieties.**] Mitteil. Deutsch. Landw. Ges. 40: 214–216. 1925.—Tests of 8 species or varieties for yield of grain showed that the blue lupine, commercial seed, gave highest yields in 1924.—*A. J. Pieters.*

6085. Myers, C. H. **Some comments on selection with special reference to potatoes.** Potato News Bull. 1: 107–112. 1924.—Selection is defined as the isolation of biotypes. A review is given of the results from selection in fruits, but selection in potatoes has been so complicated by the presence of tuber-borne diseases that the conclusions drawn are invalidated. Most selection in potatoes has been within a vegetatively propagated, pure line and has been without value, but slightly different strains have been isolated in this way. In comparative testing of selected lines a single-row plot containing 25–50 plants is recommended; it should be replicated at least 9 times and the test carried through 3 years.—*F. Weiss.*

6086. Nicholson, G. **Field experiments with maize. Grafton experiment farm. De-suckering experiments for 1919–24 summarized.** Agric. Gaz. New South Wales 36: 49–51. 1925.—In this experiment it was concluded that sucker development is favored by good rains prior to tasseling and is retarded by previous low rains. A 4-year average showed that grain production was decreased over 5 bushels per acre by de-suckering.—*L. R. Waldron.*

6087. Nicholson, G. **Field experiments with maize. Grafton experiment farm. Depth of cultivation trials, 1920–1924, summarized.** Agric. Gaz. New South Wales 36: 96–98. 1925. —Early deep, followed later by shallow, cultivation gave very slightly increased yields over shallow cultivation throughout the season, and only a small increase over deep cultivation throughout the season, as an average of 4 years.—*L. R. Waldron.*

6088. Ødelien, M. **Nogle nærliggende spørsmaal vedrørende beiteforsøkene.** [Some obvious questions from pasturing experiments.] Nordisk Jordbrugsforskning 1923: 408–414. 1923.

6089. Pinn, A. J. **A variety trial with potatoes.** Agric. Gaz. New South Wales 36: 103. 1925.—The maximum yield was secured from the variety Factor, which was harvested 1–2 weeks later than Gold Coin and Irish Cobbler.—*L. R. Waldron.*

6090. Pitt, J. M. **Farmers' experiment plots. Sorghum trials, 1923–24.** Agric. Gaz. New South Wales 36: 43–44. 1925.—Saccaline is now the most commonly grown variety of Sorghum. In a test of 8 varieties the maximum yield of 22 tons was secured from White African.—*L. R. Waldron.*

6091. Posega, Ernst. **Ueber den Einfluss der Einstrahlung auf den Boden und den Pflanzenertrag.** [Influence of radiation on the soil and on plant yield.] Mez, Bot. Archiv 9: 112–124. 1925.—Temperature and plant yield of soils in white and black receptacles vary but little. Temperature differencies of soils of different water content but of the same color are small, but the plant-yield differences are great. The maximum plant yield is obtained in a dark soil with full water capacity.—*William Seifriz.*

6092. Robison, S. C. **The recovery of potash from kelp: A review.** Sci. Agric. 4: 314–321. 1924.—Before considering the problem of extracting potassium from kelp the author briefly reviews the potash situation in the United States and Canada. The problems relative to the recovery of potash from kelp are discussed as follows: Occurrence, composition, and methods of harvesting kelp, recovery of potash and iodine, cost of operation, suggestions for improvement, statistics and the value of kelp in comparison with other potash fertilizers.—*W. J. Morse.*

6093. Rørdam, K. **Verdensproduktionen af Kunstgødning.** [World's production of fertilizer.] Tidsskr. Landøkonomi 2: 63–73. 1925.—Comments are made on statistics recently issued by the International Institute of Agriculture at Rome, to the effect that the world production of fertilizer has decreased 16.69% since 1922, the only country to show increased production being Japan.—*Albert A. Hansen.*

6094. Sanders, V. A. **Estimated crop of certified seed potatoes in northeastern region gains 155 per cent over 1923.** Potato News Bull. 2: 24–26. 1925.—This article summarizes data on the acreage, percentage of acreage passing all inspections, and yield of certified seed potatoes in Maine, New Hampshire, Vermont, New York, New Brunswick and Prince Edward Island, classified as to the varieties Irish Cobbler, Green Mountain, Spaulding Rose and others.—*F. Weiss.*

6095. Shepherd, A. N. **Irrigation farming in New South Wales.** New South Wales Dept. Agric. Farmers Bull. 148. *1–57. 26 fig.* 1925.—This bulletin is prepared for general irrigation practices in New South Wales, but particularly for the Murrumbidgee irrigation areas. The material is presented under the heads of choosing and laying out an irrigation farm; soil improvement and crop rotation; cereals for hay and green fodder; lucerne; summer fodder crops, including maize, sorghums, millets and Sudan grass; and miscellaneous crops, including potatoes, peanuts, vegetables, rice, and cotton.—*L. R. Waldron.*

6096. Souny, J. **Essais comparés de culture de blés, à l'automne et au printemps.** [Comparative experiments in autumn and spring planting of wheat.] Bull. Mus. Hist. Nat. [Paris] 29: 183–188. 1923.—Fifty-seven different varieties of wheat were cultivated in this experiment, which was conducted on a piece of land at Champlan, France. The varieties used fell

into the 3 groups, winter wheat, winter and spring wheat, and spring wheat. All of these were planted in the autumn, and then planted again in an adjoining plot the following spring. In general, all of the varieties, regardless of the group to which they belonged, succeeded better when planted in the autumn. Results are tabulated in a complete series of lists.—*John M. Fogg, Jr.*

6097. Spillman, W. J. **How much fertilizer?** Potato News Bull. 1: 183–186. 1924.—This is an exposition of Mitscherlich's law of percentage increase, and an attempt is made to apply it to data on yields in potato fertilizer experiments reported by the New Jersey and Massachusetts Agric. Exp. Stations. Examples are given of the dependence of the most profitable fertilizer application on the value of the crop. As yet sufficient data for a more extensive application do not exist in the United States.—*F. Weiss.*

6098. Stening, H. C., and G. C. Sparks. **Championship field wheat competitions. The judges' report.** Agric. Gaz. New South Wales 36: 77–91. 1925.—An account is given of competitions, under the auspices of the Royal Agricultural Society. Details of handling the crop, varieties and diseases present are presented in tabular form. Stem rust, take-all, foot-rot, and flag smut are rather common in the northwest district.—*L. R. Waldron.*

6099. Stuart, William. **Limiting factors in potato yields.** Potato News Bull. 2: 44–48, 50. 1925.—This article discusses the following causes for low potato yields: Poor selection of soil, shallow plowing, failure to conserve winter or early spring moisture, careless preparation of seed bed, lack of sufficient available plant food, poor seed, failure to use a sufficient quantity of seed, improper cultivation, failure to control insect and fungous pests, high temperature and lack of soil moisture.—*F. Weiss.*

6100. Teräsvuori, K. **Omväkstförädlingen och försöksverksamheten på väkstkulturens område i Finland. [Plant breeding and agricultural experiments in Finland.]** Nordisk Jordbrugsforskning 1923: 523–534. 1923.—A chair in Economy, including agriculture, has been maintained since 1746 and in the decades following this date a primitive system of experiments grew up and later declined leaving behind, however, not a few forage plants in culture. In 1797 an economic society was found, which initiated experiments in 1860 and has conducted these since that time at an agricultural school. In 1883 and 1889 two experimental stations were inaugurated, one specializing in fertilizer and variety tests and the other in pasture problems. A special line of work on sugar-beet growing was commenced in 1833. This work was repeated several times without success. In the last few years, however, the work has been successful. The experimental work was greatly improved by the foundation of special societies for moor culture (1894) and seed production (1904), and by the establishment of a state experiment station at Dickursby (1898). To the latter, 2 substations have more recently been added.—*Ernst Gram.*

6101. Walker, Herbert, and F. E. Greenfield. **Report on the manufacture of sugar in the Philippines.** Internat. Sugar Jour. 26: 648–652. 1924.—Clarification, liming, filtering, boiling, mill sterilization, juice straining, mud filtering, evaporation, crystallization and the advantages and disadvantages of the Petree-Door process of clarification, are briefly discussed.—*Nellie E. Fealy.*

6102. Watkins, W. R. **Farmers' experiment plots. Winter green fodder experiments, 1924.** Agric. Gaz. New South Wales 36: 93–95. 1925.—The crops grown consisted of varieties of wheat, oats and barley, grown separately, and wheat and vetches, and wheat and peas grown as mixtures. The maximum yield of 15 tons per acre was secured from Ruakura oats. Superphosphate and other fertilizers produced increased yields in a trial with Florence wheat.—*L. R. Waldron.*

6103. Weiss, Friedrich. **Der Wirkungsfaktor der Drillreihenentfernung unserer Kulturpflanzen im Wirkungsgesetz der Wachstumsfaktoren. [The effect of drill-row distance on the growth factor of agricultural plants.]** Mez, Bot. Archiv. 9: 377–385. *Fig. 1.* 1925.—Mitscherlich found 0.016 to be the operative factor for distances between drill rows of potatoes, wheat, rye, etc. The author finds that with every plant it is possible to obtain any desired drill-row factor by merely selecting a suitable distance between plants in the drill row. On the other hand it is possible by combination of drill-row distance and distance in the row to arrive at any desired approach to a maximum yield per area. The following values are sug-

gested: operative factor 0.015; drill row, 20 cm.; maximum area yield, 76.5 %.—*Carl Mez (transl. and abridged by William Seifriz).*

6104. Wenholz, H. **A score card for judging green fodder maize.** Agric. Gaz. New South Wales 36: 45–47. 1925.—The points scored are height and weight of stalks, leafiness and production of ears, condition of fodder, character of stems, uniformity and general appearance of exhibit, and freedom from insect pests and disease.—*L. R. Waldron.*

6105. Westh, T. C. **Systematiske, landøkonomiske Jordbundsu Undersøgelser, med særligt Henblik paa kalktrængende og vandlidende Jord.** [Systematic agricultural survey, particularly with reference to lime-requiring and watersick soil.] Nordisk Jordbrugsforskning 1923: 260–268. 1923.—In 1918–1922, in Denmark, 184,156 ha. of field and meadow were surveyed, of which 30.8% needed draining. Of about 43,000 soil samples, 56.9% showed lack of lime. The results of the survey were mapped with indications of the boundary lines of lime-requiring areas and those needing draining, and with the localities where lime or marl can be dug. A list of the reports of Statens Grundforbedringsvæsen [State Amelioration Service] is given.—*Ernst Gram.*

6106. Whittet, J. N. **Pasture improvement. Work in northern tableland districts.** Agric. Gaz. New South Wales 36: 37–42. *7 fig.* 1925.—The main native grasses are: *Amphilophis decipiens, Andropogon affinis, Themeda Forskalii,* and *Poa caespitosa.* The main introduced grasses and clovers which are used for improvement are: *Dactylis glomerata, Lolium perenne, Trifolium pratense* var. *perenne, Phalaris bulbosa, Avena elatior, Festuca elatior, Festucia arundinacea,* and *Poterium sanguisorba. Phalaris bulbosa* is considered the best.—*L. R. Waldron.*

6107. Whittet, J. N. **Pasture improvement. Work in the Crookwell district.** Agric. Gaz. New South Wales 36: 113–120. *13 fig.* 1925.—Native grass pastures are invariably of poor quality and capable of carrying, when cleared, but 1 sheep per acre. The most important native grasses are listed. Upon a 200-acre tract of improved pasture sown to a mixture of *Dactylis glomerata, Lolium perenne, Trifolium pratense perenne,* and *Poterium sanguisorba,* 6 sheep could be carried per acre, except in the winter season. Native pasture land, disked and seeded to *Trifolium subterraneum* at the rate of 2 pounds per acre, was found to carry 2 sheep per acre, thus practically doubling the native carrying capacity. Top-dressing with superphosphate brings about a still further improvement. *Trifolium subterraneum* has been found to choke out such weeds as *Rumex acetosella* and *Carduus lanceolatus.*—*L. R. Waldron.*

6108. Witte, H. **Om hårdskalige bäljväkstfröns groning i jord.** [The germination of impermeable seed in soil.] Nordisk Jordbrugsforskning 1923: 172–181. 1923.—Of the impermeable seed selected from the germinator, and germinated in the field during the 1st year the results were: Red clover 4.2%, alsike 5.2%, birds-foot trefoil 5.4%, and blue alfalfa 37.9%. The following spring the additional germination was 62.3, 56.5, 58.5%, and 1.8 respectively, and during the summer 2.7, 1.9, 3.4, and 12.1%, respectively. The permeability is influenced by the harvest conditions, the type of soil in the seed bed, seeding time, and alternating freezing and thawing. With an earlier sowing perhaps a higher 1st-year germination of the first 3 varieties would have been obtained.—*Ernst Gram.*

6109. Wittmack, L. **Botanik der kulturtechnisch und landwirtschaftlich wichtigen Pflanzen.** [Botany of industrially and agriculturally important plants.] *351 p. 208 illus.* Paul Parey: Berlin, 1924.—The important species throughout the vegetable kingdom are discussed separately, particularly with regard to the principal botanical characteristics, adaptations, and utilizations. With regard to pathologically injurious plants, such as rusts, control measures are briefly noted. Much more consideration is given in the book to the grasses than to the other branches of the vegetable kingdom. Individual chapters are devoted to the anatomy and life-history, systematology, and vegetative identification of grasses. A special chapter is devoted to the life-history and systematology of the legumes, also to the nutritive content of the important grasses and legumes. Seed-mixtures for meadows and pastures, and the vegetation adapted to the various soil types, are also discussed.—*W. B. Lydenberg.*

6110. Wylie, William. **Recent milling practice in the Philippines, Hawaii, Australia, and Java.** Internat. Sugar Jour. 26: 645–647. 1924.—Philippine cane, a 1-year variety, is

high in sucrose, but usually low in fiber content. Owing to high tonnage grinding rate of most of the Centrals, extraction results are lower than in Hawaii. The Hawaiian cane variety is a better feeder, due, it is believed, to its longer staple fiber content. Statements and recommendations as to changes in procedure and machinery to increase extraction are made. Milling systems in the countries are compared; slippage and its causes are considered and remedial measures recommended; and the necessity of avoiding the grouping of rolls of different diameters and the subject of maceration are discussed.—*Nellie E. Fealy.*

SOIL SCIENCE (EDAPHOLOGY)

6111. Anonymous. **Fourth International Conference of Pedology.** Internat. Rev. Sci. and Pract. Agric. n.s. 2: 754–764. 1924.—The organization and work of the 4th Conference and work of commissions covering the field of pedology or soil science are reported.—*James E. Chapman.*

6112. Allison, F. E., E. B. Vliet, J. J. Skinner, and F. R. Reid. **Greenhouse experiments with atmospheric nitrogen fertilizers and related compounds.** Jour. Agric. Res. 28: 971–976. *Pl. 1.* 1924.—Pot experiments with wheat and beans on 2 types of soil were made, using air-derived nitrogen materials. There was no marked difference in the effect of sodium nitrate, ammonium sulphate, urea, ammonium nitrate, calcium nitrate and ammoniated superphosphate, on growth of beans and wheat in the early stages. Ureaphos gave poorer results. A part of the nitrogen of this compound is in the form of guanylurea, which is toxic. Dicyanodiamide injured the growth of wheat and beans causing a burning of the tip of the wheat blades and a retarded growth.—*J. J. Skinner.*

6113. Barthel, C. **Stallgödslans inverkan på celluslosens sönderdeling i akerjorden. [The effect of barnyard manure on the cellulose dissolution in cultivated soil.]** Nordisk Jordbrugsforskning 1923: 299–304. 1923.—The degree of cellulose dissolution is indirectly proportional to the amount of nitrogen added in the form of ammonia in the manure. The effect exerted the 1st year by nitrogen in manure on the microbiological processes is probably due to the nitrogen present in the ammonia.—*Ernst Gram.*

6114. Bjørlykke, K. O. **Forsøk paa inddeling av det norske jordsmon. [An attempt to classify Norwegian soils.]** Nordisk Jordbrugsforskning 1923: 360–370. *1 map.* 1923.

6115. Bondorff, K. A. **Karforsøg med Mergel. [Pot experiments with marl.]** K. Vetog. Landbohøjskole Aarsskr. [Copenhagen Agric. Coll. Yearbook] 1924: 125–132. *1 fig.* 1924.—With English summary. A marl containing 0.60% of K_2O, utilized for cultivation of a great bog in Jutland, was tested, using the peat from the bog and wild white clover as the crop, against another marl, which was richer in lime but contained only 0.25% K_2O. Giving the pots equal amounts of carbonate of lime and varying the amount of potassium used, the marl poor in carbonate but rich in potassium and other minerals yielded 21–22% more than the other. Also, with a very poor sandy soil and buckwheat, the 1st marl outyielded the 2nd.—*Ernst. Gram.*

6116. Borg, J. **Något om Planläggning och beräkning af gödslingsförsök. [Planning and calculation of fertilizer tests.]** Nordisk Jordbrugsforskning 1924: 396–406. 1924.—In experiments for orientation, where the number of plots is limited, the conclusions are safest when the plan is indirect (that is, unfertilized, phosphate + nitrogen, phosphate + potassium, nitrogen + potassium, nitrogen + potassium + phosphate) and the calculation is made, not by simple subtraction, but by the equation method.—*Ernst Gram.*

6117. Feilitzen, H. v. **Den lokala gödslingsförsöksverksamheten i Sverige och Centralanstaltens samarbete med Hushållningssällskapen i detta arbete. [The local fertilizer tests in Sweden and the cooperation of the central station with the economic societies.]** Nordisk Jordbrugsforskning 1923: 398–404. 1923.—Local fertilizer tests on peat have been known in Sweden since 1880 and on mineral soils since 1900. From the beginning, the work was carried out by the provincial ecomonic societies, but under supervision of the Agricultural Academy, later by the Central Institute for Agricultural Research. The number of local experiments has increased from 99 in the year 1900 to 760 in 1922, the total for 1900–1922 amounting to more than 10,000. The experimental work is now supervised by a joint committee with representatives from the Central Institute, the agricultural schools, and the economic societies.—*Ernst Gram.*

6118. Frosterus, B. **Förslag från kommitten för nomenklatur och klassification av jordarter och jordmaner.** [Proposals from the committee for nomenclature and classification of soils.] Nordisk Jordbrugsforskning 1923: 334–359. 1923.—At a conference in Copenhagen, a committee was constituted with the aim of settling the terminology for Fenno-Scandinavia. This paper contains a review of the terms on which the committee has agreed, with references to individual terms. For the humus soils and the petrographic classification the task is not completed.—*Ernst Gram.*

6119. Gerlach and Seidel. **Über die Stickstoffdüngung der Lupinen.** [Fertilizing of lupines with nitrogen.] Mitteil. Deutsch. Landw. Ges. 40: 146–147. 1925.—Yellow lupines were fertilized with "Harnstoff" and blue lupines with sodium nitrate, but the yields from plots with and without fertilizers were practically the same. Contrary to the claim made by Vogel, the application of nitrogenous fertilizers did not affect the alkaloid content of the lupines. The soil of the experimental field was a yellow sand very poor in humus.—*A. J. Pieters.*

6120. Gibbs, Charles S. **The rôle of bacteria in nature.** China Jour. Sci. & Arts 1: 366–371. 1923.—A resume is given of the relationship of microörganisms to such processes in nature as the disintegration of rocks to form soil, the decomposition of organic matter and the fixation of nitrogen. The dependence of all plant and animal life on microbial activities is emphasized.—*R. H. Porter.*

6121. Goldschmidt, V. M. **Glimmermineralernes betydning for planterne.** [The importance of micaceous minerals for plants.] Nordisk Jordbrugsforskning 1923: 382–386. 1923.—Potassium feldspar dissolves much more slowly than biotite, sericite, and other micaceous minerals. In the presence of neutral salts of strong acids the potassium of mica dissolves easily, 3–200 times faster than from feldspar. In sand and water cultures, oats and peas have satisfied their potassium requirements from biotite. Field experiments are being continued.—*Ernst. Gram.*

6122. Gørbing, J. **Om Jordbundsundersøgelser med særligt Henblik paa Bestemmelse af Kalktrangsforholdene indenfor de enkelte Jordbrug.** [Soil investigations, particularly for lime requirement on individual farms.] Ugeskr. Landmaend 69: 535–539. 1924.—The author has investigated large German properties systemmatically, partly on the basis of the Danish methods. The pH is determinated colorimetrically in water solution as well as in ammonium chloride solution, and the relation between these 2 values is considered important. The Azotobacter test has been modified by addition of Bromcresolpurple to the mannite solution, for investigation of the time elapsing before pH 5.8 is reached. Total acid is determined after Daikuhara, and catalytic power after Hasenbäumer and König. By a combination of the results it is possible to indicate where soil improvements should be initiated, and where lack of lime is beginning to appear.—*Ernst Gram.*

6123. Hansen, F. **Humle-Sneglebælg og Reaktionen.** [Medicago lupulina in relation to soil reaction.] Ugeskr. Landmaend 69: 255–256. 1924.—Material presented by H. R. Christensen indicates that *Medicago lupulina* will thrive at lower pH values on light soils than on heavier soils. One optimal pH value for *Medicago lupulina* cannot be indicated, but it seems that a plurality of the soils investigated have the best growth of *Medicago lupulina* between pH 6.5 and 7. Differences in soil reaction have a great influence on many soil factors, and the way in which plants respond to different reactions may be only indirect effects of pH variations.—*Ernst Gram.*

6124. Hasselbalch, K. A. **Kiddike som Kalktrangsviser.** [Raphanus raphanistrum as indicator of lack of lime.] Ugeskr. Landmaend 68: 518–519. 1923.—On one part of a barley-field *R. raphanistrum* prevailed as a weed, while in the remainder *Sinapis arvensis* was predominant. The boundary line was rather marked and in the autumn it was clear that *Medicago lupulina*, which was sown as a ley, would thrive only in the Sinapis region. The pH of the Raphanus region varied from 5.8 to 6.2, while in the Sinapis region it was 6.6–7.0. The difference appears to be due to the circumstance that lime was given 15 years ago to that part of the field now having Sinapis as a weed.—*Ernst Gram.*

6125. Hoffman, Max. **Dungerfibel.** [A fertilizer handbook.] *22nd ed. 208 p.* Illus. Deutsch. Landw.-Ges.: Berlin, 1922.—This volume is designed as a key to the fertilizer list

of the Deutsch. Landw. Ges., based on the latest results of the investigations by M. Hoffman. It is a handbook of information on the composition and rational use of both stable manure and commercial fertilizers. Recommendations for the selection and application of fertilizer for various crops are based on experiments conducted at several German experiment stations. Useful tables are given and the book ends with rather full bibliography of German works on fertilizers.—*T. D. Rice.*

6126. Kadish, Victor H. **Investigations of the fertilizing value of activated sludge.** Internat. Conference Sanitary Engineering. *P. 134-138.* London, 1924.—The completed sewage disposal plant of Milwaukee will produce 100 tons of dry fertilizer daily, the composition of which will be: Moisture 6.20%, total nitrogen as ammonia 7.42%, water soluble nitrogen as ammonia 1.13%, active water insoluble organic nitrogen as ammonia 4.17%, availability of water insoluble organic nitrogen 66.35%, total availability of nitrogen 71.48%, total phosphoric acid 2.36%, potash (water soluble) 0.13%, fat 4.87%. The economic success of the Milwaukee sewage disposal plant depends on marketing the prepared sludge at a price equal to or above the cost of production. Attainment of high fertilizing value and its practical applications have therefore been carefully studied. Chemical conditioning by use of phosphoric acid, sulphur dioxide, aluminum sulphate and sulphuric acid have all been tried. Phosphoric acid was discarded because of high cost and inability to recover more than a low percentage in the sludge. Sulphur dioxide was eliminated because of the extremely sensitive system of acid control required. The choice then narrowed down to aluminum sulphate or sulphuric acid. Aluminum sulphate invariably gives the best absolute filtering efficiencies, while sulphuric acid always gives a higher total nitrogen content in the treated sludge. There is a slightly less nitrogen loss in the filtrate when aluminum sulphate is used. The temperature of filtration, however, has a more pronounced effect; at 70–80°F. only ½ as much nitrogen is lost in the filtrate as at 160°F. Sewage containing 1% solids shows about 10% more total nitrogen loss in the filter effluent than 2% sludge. The cost of acid and alum are about equal in the cold treatment, but with increasing temperatures aluminum sulphate costs rise disproportionately.—Various experiments to determine the fertilizing value of the sludge have been conducted. It was demonstrated that a considerable portion of the nitrogen in sludge becomes available in 2 months, producing decidedly better growth than sheep manure and very nearly as good growth of oats and corn as tankage, dried blood, fish scrap and cotton seed meal. Field experiments with other crops such as rye, potatoes and corn showed favorable comparison with commercial mixtures.—Numerous lawn plots fertilized at the rate of 1 ton of sludge per acre gave better results than were obtained from the use of sheep manure. Extensive experiments on golf courses have also been conducted with promising results. The tests as a whole indicate that activated sludge has a definite fertilizer value.—*J. K. Hoskins.* (*Public Health Engineering Absts.*)

6127. Kristensen, M. K. **De danske Gødsningsforsøg og hvorledes deres Resultater er komne den danske Landmand til Nytte.** [**Danish fertilizer tests and the way they have been made useful for the Danish farmer.**] Nordisk Jordbrugsforskning 1923: 387–397. 1923.—The local fertilizer tests have been of revolutionary importance for farming. They are conducted by the agricultural associations but placed on the individual farms and the farmer must aid in the work; it is his own experiment. Annually, the local results are collected in provincial reports. The number of local experiments has increased from 2 in 1893 to more than 2000 in 1922; the total number amounts to 32,500. From all these experiments knowledge has been gathered of the efficiency of fertilization under different farm conditions. In 30 years the quantity of fertilizers imported has been multiplied, for phosphate 6 times, for potassium 10 times, and for nitrates 90 times. Still, the use of fertilizers can be raised a good deal before the economical limit is reached.—*Ernst Gram.*

6128. Oakley, R. A. **Fertilizers in relation to quality of turf and to weed control.** Bull. Green Section U. S. Golf Assoc. 5: 50–56. 1925.—At Arlington Farm, Virginia, plots of a new seeding of Rhode Island bent grass were treated respectively with ammonium phosphate, ammonium sulphate, sodium nitrate, acid phosphate, potassium chloride, calcium cyanamid, bone meal, soybean meal, cottonseed meal and calcium carbonate. At the end of 3 years the soil of the plots treated with ammonium fertilizers was appreciably more acid than at the be-

ginning of the experiment and bore excellent weedless stands of bent grass. In the remaining plots, especially those with sodium nitrate and lime, the soil was more nearly alkaline than at the beginning and the sod was heavily infested with crab grass, goose grass, white clover and moss. Ammonium phosphate is considered slightly superior to ammonium sulphate because of the better residual effect of phosphorous than of sulphur.—*L. W. Kephart.*

6129. Smith, R. S., E. E. DeTurk, F. C. Bauer, and L. H. Smith. **Grundy County soils.** Illinois Agric. Exp. Sta. Soil Rept. 26. *1–66. Illus., maps.* 1924.—This survey deals with the soils of an area of about 427 square miles lying principally in the early Wisconsin glaciation in northeastern Illinois. With respect to their geological relationships the soils fall into 4 general groups, namely, upland, terrace, swamp and bottom land, and residual soils. These groups are subdivided into types on the basis of the characteristics of the soil material. A map shows the distribution of these types in the county. Analyses and data from field experiments are presented relating to the fertility requirements and crop adaptations of the principal soil types. An appendix contains explanations for interpreting the soil survey and general information on the maintenance of fertility.—*T. D. Rice.*

6130. Smith, R. S., E. E. DeTurk, F. C. Bauer, and L. H. Smith. **Hancock County soils.** Illinois Agric. Exp. Sta. Soil Rept. 27. *1–62. Illus., maps.* 1924.—This report deals with the soils of an area of 765 square miles located in the extreme western part of Illinois. The soils are badly classified with respect to their geologic relationships and these broad groups are subdivided into types on the basis of their physical and chemical characteristics. A map accompanying the report shows the area and distribution of the types. Analyses and data from field experiments are presented relating to the fertility requirements and crop adaptations of the principal soil types. An appendix contains explanations for interpreting the soil survey and general information on the maintenance of fertility.—*T. D. Rice.*

6131. Stoepel, Paul. **Differenzdüngungen mit schwefelsaurem Ammoniak bei Cruciferen, Cerealien und Leguminosen mit besonderer Berücksichtigung der im Boden vorhandenen Stickstoffmenge. [Fertilization with ammonium sulphate.]** Mez, Bot. Archiv **9**: 124–156. 1925.—Mustard, barley, and oats have the ability to use to the fullest extent the nitrogen content of the soil, and are therefore profitable to plant. With a nitrogen fertilizer, clover shows an increase in yield at the first cutting but diminishes with each succeeding cutting.—*William Seifriz.*

6132. Veihmeyer, F. J., O. W. Israelsen, and J. P. Conrad. **The moisture equivalent as influenced by the amount of soil used in its determination.** California Agric. Exp. Sta. Tech. Paper **16**: 1–64. *Pl. 1–2.* 1924.—After a discussion of the work done by others on moisture equivalent determinations, and of the difficulties encountered in getting accurate and reliable results, the authors report a series of experiments using the standard moisture equivalent centrifuge. The soils used were Yolo clay, Yolo clay loam, Yolo silt loam, Twin Falls silt loam and Oakley fine sand. Detailed descriptions are given of the methods and apparatus used. Factors noted were the influence of the weight of the soil used, the distribution of moisture within samples, apparent specific gravity of samples after centrifuging, and the influence of artificial packing. Results showed that the moisture equivalent is influenced by the amount of soil used in its determination—the smaller the sample, the larger the percentage of water retained. Within a 60-gram block of soil, the moisture content increases from the inner to the outer surface, and this is probably true for much larger blocks. The apparent specific gravity of a 60-gram block of soil is much greater than that of a smaller one, decreasing continuously with the size of the sample. Increasing the pressure on the soil in the centrifuge cups by placing weights on the inner surface, decreases the amount of water retained. There is a discussion of the establishment of an equipotential region throughout the block of soil, and of the capillary potential. The authors consider that further standardization of method is necessary. A bibliography is given.—*Margaret Buwens.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Carroll W. Dodge, *Editor*
Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 6229, 6568, 6597, 6598, 6614)

6133. Anonymous. **Bengt Högrell.** Bot. Notiser **1922**: 109–110. 1922.—Högrell was born July 14, 1832, at Enslöv, Halland, Sweden, and died Feb. 9, 1922, at Olofstorp. He graduated at Lund in 1856 and was the rector of Angered and Bergjum's Parish since 1866. He published works on floristics, plant geography and history.—*P. A. Rydberg.*

6134. Anonymous. **Fredrik Elias Ahlfvengren.** Bot. Notiser **1922**: 109. 1922.—Ahlfvengren was born Apr. 7, 1862, in Hejde on the island of Gotland in the Baltic. He graduated from the "gymnasium" in 1883, and received his Ph.D. in 1897 at Lund. In 1893–1894 he was curator at the National Museum at Stockholm and assistant at the Botanic Garden. He taught in several schools and since 1909 was professor of biology and chemistry at the Northern Realgymnasium in Stockholm. He has published articles on plant anatomy, physiology, plant geography, etc., and contributed to the choripetalous families of Neuman's "Sverges Flora." He died Dec. 22, 1921.—*P. A. Rydberg.*

6135. Anonymous. **Johan N. F. Wille.** Bot. Notiser **1924**: 207. 1924.—Wille's death occurred on Feb. 4, 1924, at the age of 65. Since 1893 he has been professor of botany at Kristiania University, and has been concerned mostly with the anatomy, physiology, and geographical distribution of the algae. He is also the author of much popular literature.—*H. K. Svenson.*

6136. Anonymous. **Johan Oscar Hagström.** Bot. Notiser **1922**: 223. 1922.—Hagström was born March 21, 1860, in Bettna, Södermanland, Sweden, graduated in Upsala in 1879, admitted to the ministry in 1883, became curate in Lyvik in 1899 and rector in Västra Emtervik, Värmland, in 1912. He specialized in the genus *Potamogeton* and contributed that genus for the floras published by Neuman (1911), and Lindman (1918).—*P. A. Rydberg.*

6137. Anonymous. **Leopold Martin Neuman.** Bot. Notiser **1922**: 108–109. 1922.—Neuman was born in Halmstad, Sweden, Sept. 11, 1852, graduated from the gymnasium in 1871, obtained his Ph.D. at Lund in 1881, served as teacher of natural sciences at several schools and for nearly 30 years was president of the gymnasium at Ystad. His publications were mostly on floristics and plant geography, *Rubus* and *Sparganium.* In 1901 he published "Sverges Flora," a manual for the schools. He died Feb. 17, 1922.—*P. A. Rydberg.*

6138. Anonymous. **The Lingnaam Agricultural Review.** China. Jour. Sci. & Arts **1**: 266–267. 1923.—The appearance of this periodical is noted. It is published by the College of Agriculture, Canton Christian College, the first issue making its appearance in June 1922.—*Albert N. Steward.*

6139. Anonymous. **Thorild Wulff.** Bot. Notiser **1922**: 110. 1922.—A tablet in memory of Wulff has been placed in the east wall of the Botanical Museum at Lund. At the top, in Danish, is the following: "Dr. Thorild Wulff, born Apr. 1, 1877, at Gothenburg, died Aug. 29, 1917, on the Thule-Expedition, offering his life for Science;" and around it is the quotation: "Laid myself to rest at 7 o'clock P.M. because I did not wish to be an impediment to the ability of my comrades to travel, on which their rescue depends." Log of Aug., 1917.—*P. A. Rydberg.*

6140. Anonymous. [Rev. of: Woodhead, H. G. W. **The China Yearbook, 1923.** *1229 p.* Tientsin Press, Ltd., 1923.] China Jour. Sci. & Arts **1**: 246. 1923.

6141. Christensen, C. **Martin Vahl og hans Samtid.** [Martin Vahl and his contemporaries.] Nat. Verden **7**: 316–329, 337–351. *4 portraits.* 1923.—In addition to the life and work of Martin Vahl, a student of Linné and one of the editors of the Flora Danica, much new historical information is given regarding T. Holmskiold, E. N. Viborg, and others of his contemporaries.—*Ernst Gram.*

6142. Falck, R. **Nekrologe deutscher Botaniker. Alfred Moeller.** [Obituaries of German botanists. Alfred Moeller.] Mez, Bot. Archiv **6**: 1–7. 1924.—Alfred Moeller was

born in Berlin in August, 1860, and studied under Brefeld at Eberswald and Münster, receiving his doctorate in 1887. He spent several years in Brazil, returning in 1895. In 1896 he went to Eberswald where he established a mycological institute in 1901 and developed work in forest pathology. He died in November 1922.—*C. W. Dodge.*

6143. Gerber, C. **Les jardins botaniques toulousains et l'étude de la flore pyrénéenne, sous l'Ancien Régime et la Révolution, d'après des documents inedits.** [The botanical gardens at Toulouse and the study of the flora of the Pyrenees under the monarchy and the revolution.] Bull. Soc. Bot. France 71: 788–842. 1924.—The 1st garden of simples was established at Toulouse by Antoine Sage in 1729. It gradually became a teaching collection for the medical school under the subsequent direction of Perpessac and Dubernard. Philippe Picot de Laperouse in 1778 began to introduce plants from the Pyrenees and gradually increased his influence until medical students were excluded and the faculty of medicine decided to establish a new garden for teaching purposes in 1783. During the Revolution the garden of the Academy of Sciences again became a medical establishment under Limes and Dubernard. Soon Laperouse and Ferriere gained control of the garden again and undertook an expedition to the Pyrenees to secure material to restock the garden.—This article is full of quotations from original documents and contains a bibliography of 35 titles.—*J. Chifflot.*

6144. Gerber, C. **Tournon et la première flore toulousaine.** [Tournon and the first flora of Toulouse.] Bull. Soc. Bot. France 71: 768–780. 1924.—Dominique Jerome Tournon was born at Toulouse in November 1758, where he received the doctorate in 1788 and became a teacher at the Academie des Sciences de Toulouse and later in the medical school there. He prepared a local flora, "Botanicon tolosanum," in 1789, which was not submitted for publication until 1811. It was rejected by a committee of the medical school whose report is reprinted. Most of the objections have since been shown to be erroneous or of minor value and were probably motivated by jealousy.—*J. Chifflot.*

6145. Gertz, Otto. **Otto Nordstedt. En minnesteckning.** [A memorial.] Bot. Notiser 1924: 97–125. *Portrait.* 1924.—Carl Fredrik Otto Norstedt's death occurred on Feb. 6, 1924. Born in Jönköping in 1835, and a relative of Linnaeus, he studied at Lund, and was for 51 years editor of Bot. Notiser. A pioneer in the systematic study of phytoplankton, his publications were mainly on the Characeae and desmids, of which he made a world-wide study. The "Index Desmidiacearum," published in 1896, and his large exsiccatae are the best known works. A long list of publications is appended.—*H. K. Svenson.*

6146. Guillaumin, A. **Notice complémentaire sur le jardinier Delahaye (alias Lahaie).** [Supplementary note on the gardener Delahaye.] Bull. Mus. Hist. Nat. [Paris] 28: 109, 110. 1922.—This supplements a note which appeared in Bull. Mus., 1910, with information explaining the change of name from Delahaye to Lahaie, owing to the French Revolution. Attention is called to the great importance attached to the botanical collections made by Delahaye in New Caledonia.—*John M. Fogg, Jr.*

6147. Hicken, C. M. **Bibliografia del doctor Eduardo Ladislao Holmberg.** [Bibliography of Dr. Eduardo Ladislao Holmberg.] Darwiniana 1: 7–21. *Portrait.* 1922.—This extensive bibliography of the works of the Argentine scientist, Homlberg, is systematically arranged for the convenience of the reader.—*Author.*

6148. Lagershausen. **Friedrich Grundner.** Mez, Bot. Archiv 3: 1–2. 1923.

6149. Larsen, C. S. **Christian Theodor Vaupell.** Nat. Verden 7: 164–171. *Portrait.* 1923.—An account of Vaupell's contributions to plant anatomy, forest ecology, palaeontology, and botanical instruction.—*Ernest Gram.*

6150. Loesener, Th. **Gustav Lindau.** Mez, Bot. Archiv 7: 4–6. 1924.

6151. Loesener, Th. **Nekrologe deutscher Botaniker. Eduard Seler.** [Obituaries of German botanists. Eduard Seler.] Mez, Bot. Archiv 7: 1–4. 1924.—Eduard Georg Seler, born in 1849, was best known for his works on ethnology and Mayan archaeology. He was also a discriminating collector of flowering plants on his several journeys to Mexico, Central and South America. Most of his collections are found in Berlin.—*C. W. Dodge.*

6152. Matthews, J. R. **Obituary notice of William Evans, 1851–1922.** Trans. and Proc. Bot. Soc. Edinburgh 28: 189–192. 1923.

6153. Muench, E. **Nekrologe deutscher Botaniker. Franz Wilhelm Neger.** [Obituaries

of German botanists. Franz Wilhelm Neger.] Bot. Archiv 9: 1–3. 1925.—Neger was a teacher at Weihenstephan, curator of the herbarium in München, professor of forest botany in Eisenach, later in Tharandt (1905–1920), and professor in the Technische Hochschule and director of the botanical garden in Dresden until his death in May, 1923. A quotation from Sachsse describes his personality in detail.—*C. W. Dodge.*

6154. Ostenfeld, C. H. **Botanisk Haves 50 Aars Jubilæum. [The 50th anniversary of the Botanical Garden of Copenhagen.]** Nat. Verden 8: 385–394. 1924.—While the former botanical gardens of Copenhagen, of which the 1st was founded in 1600, were purely scientific, the present garden is not only a part of the university but also attempts to give popular knowledge and has an attendance of about 1½ million in a year. The garden was laid out in 1871–1874 on a part of the old fortifications. In 1876 a museum was erected in the garden, and still later a laboratory building. Among the directors were Joh. Lange, Eug. Warming, and Raunkiær. The number of species grown, aside from ornamentals, amounts to 11–12000.—*Ernst Gram.*

6155. Paulsen, O. **Eugen Warming.** Nat. Verden 8: 193–201. *Portrait.* 1924.

6156. Paulsen, O. **N. Wille.** Nat. Verden 8: 236. *Portrait.* 1924.

6157. Printz, Henrik. **Professor Dr. N. Wille.** Nyt Mag. Naturvidensk. [Kristiania] 62: 1–51. *1. pl.* 1924.—This is a biography of N. Wille (1858–1924), with many personal recollections. A complete list of Wille's publications occupies the last 25 pages.—*K. Münster Strøm.*

6158. Smith, William G. **Obituary notice. William Carruthers. 1830–1922.** Trans. and Proc. Bot. Soc. Edinburgh. 28: 118–121. 1922.—After completing his formal education at New College, Edinburgh, in 1858, he joined the staff of the British Museum, where he developed the paleobotanical collections. He was appointed a keeper in 1871, a position he held until his retirement in 1895. He was also much interested in agricultural botany.—*L. R. Abrams.*

6159. Smith, W[illiam] Wright. **Obituary notice of Sir Isaac Bayley Balfour.** Trans. and Proc. Bot. Soc. Edinburgh 28: 192–196. *Portrait.* 1923.

6160. Stover, W. G. **Augustine Dawson Selby.** Phytopathology 15: 1–10. *Pl. 1.* 1925.—A portrait of Professor Selby, a short biography, and a bibliography of his published works are given.—*B. B. Higgins.*

6161. Trelease, Sam F., and Emma Sarepta Yule. **Preparation of scientific and technical papers.** *113 p.* Williams & Wilkins Company: Baltimore, 1925.

6162. Wangerin, W. **August Schulz.** Mez, Bot. Archiv 3: 2–4. 1923.

6163. Wangerin, W. **Hugo Cowentz.** Mez, Bot. Archiv 3: 8–9. 1923.

6164. Ward, F. Kingdon. **Seventh expedition in Asia.** Gard. Chron. III. 72: 268, 296–297, 325, 352, 378–379. *Fig. 137.* 1922; 73: 22, 50, 80, 107, 134, 162, 186–187, 214, 246, 300, 350. 1923; 74: 6, 40, 102, 130, 188–189, 234, 262, 294, 322, 378. *Fig. 86, 106, 135.* 1923.—The itinerary of the expedition to upper Burma is described in some detail with incidental mention of a large number of plants noted.—*P. L. Ricker.*

6165. Westermann, T. **Peter B. Feilberg.** Tidsskr. Landøkonomi 2: 49–61. 1925.—Feilberg, practical farmer and noted drainage engineer, was born November 20, 1835, and died January 12, 1925. He turned many thousands of acres of swamps and bogs into productive soil and drained numerous lakes, including Lake Soholm near Elsinore, an undertaking that required nearly 8 years to complete. As a representative of the Royal Danish Agric. Soc. he spent a number of years in successful drainage work in Iceland where bogs and swamps abound. While there he founded the only agricultural college on the island, now a state institution. He did much to demonstrate the possibilities of agriculture in Iceland. A bibliography of 18 titles is appended.—*Albert A. Hansen.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 6040, 6149, 6269, 6289, 6337, 6338, 6491, 6492, 6583, 6599, 6695, 6806)

6166. Anonymous. **Educational notes and intelligence.** China Jour. Sci. & Arts **1**: 529–534. 1923.—Following a general statement concerning the situation and equipment of West China Union University, Chengtu, Szechuan, a brief description is given of the work undertaken by the departments of chemistry, biology, and physics.—The courses presented by the School of Arts and Science of the Shantung Christian University are mentioned under the departments of history, sociology, English, Chinese, chemistry, physics, and biology.—*Albert N. Steward.*

6167. Reed, George M. **Sorghum.** Brooklyn Bot. Gard. Leaflets 13^{1-3}: 1–12. *Fig. 1–3.* 1925.—This leaflet is prepared to accompany an educational exhibit of the different types of sorghum, for the high schools. It comprises a general account of the sorghums; their cultivation in the old and new worlds; their distribution and botanical characteristics; the different agronomic groups in the U. S. A., that is, broom corn, grass sorghum, sorgho, and grain sorghum; and finally, an account of the sorghum smuts.—*A. H. Graves.*

6168. Reinheimer, H. **Symbiosis explained.** West India Committee Circ. **40**: 36–37. 1925.—This popular article explains symbiosis as this term is used in biological sciences. Many examples of symbiotic relations between plants and insects and between different plants are given. The author points out the value of these relations, particularly in the case of the orchids and the fungi (*Rhizoctonia*) but also in the lichen association of fungus with alga.—*H. N. Vinall.*

6169. True, A. C. **The services of American agricultural colleges.** Ann. Amer. Acad. Political & Social Sci. **117** [205]: 88–93. 1925.

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 6198, 6199, 6298, 6302, 6322, 6385, 6443, 6452, 6581, 6616)

6170. Baird, E. A. **The structure and behavior of the nucleus in the life history of Phycomyces nitens (Agardh) Kunze and Rhizopus nigricans Ehrbg.** Trans. Wisconsin Acad. Sci. **21**: 357–380. *2 pl.* 1924.—The nucleus in *Phycomyces nitens* and in *Rhizopus nigricans* is a dense, homogeneous, chromatin body. The nucleus divides by a method of fragmentation into several portions; the complete separation of these fragments is brought about by growth of a vacuole formed within the body of the mother nucleus. In some instances the separation of the daughter nuclei is aided by the streaming of the protoplasm. Nuclear division is influenced by the amount of water absorption and water excretion. In zygospore formation, no nuclear fusions seem to occur. In *Phycomyces nitens*, after the fusion of the 2 gametes, the nuclei divide rapidly until the zygospore is mature. There is no evidence of nuclear division in the germ tube formed from the zygospore. When divisions cease, both in the zygospore and in the vegetative hyphae, reserve material is stored in the vacuoles associated with the nuclei. In embryonic sporangiospores, nuclear portions reassemble to form the nuclei of mature spores. Upon the resumption of growth of mycelium from spores, the reserve of the nuclear vacuoles contributes to the formation of new cytoplasm.—*E. L. Fisk.*

6171. Frey, Charles N. **The cytology and physiology of Venturia inaequalis (Cooke) Winter.** Trans. Wisconsin Acad. Sci. **21**: 303–343. *2 pl.* 1924.—A comprehensive review of the literature pertaining to sexuality in the fungi is given. Perithecia of *Venturia in-*

aequalis were studied from leaves, and in culture medium at 8°C. In the development of the young perithecium, a single-branch hypha in coiled form enlarges to form the ascogonium, with a tongue-like trichogyne. In early stages ascogonium and trichogyne are non-septate; after fusion with the antheridia they become multinucleate and the ascogonium becomes septate. No nuclear fusion was observed in the ascogonium, but pairing of nuclei is suggested, and shown in cells in later stages. No evidence of typical ascogenous hyphae was found, but apparently there is a breaking up and budding of the large cells of the ascogonium into a number of small cells, some of which become initial ascus cells. In the ascus, the presence of a central body whose fibers function in cutting out the spore is suggested. Discharge of spores from the perithecium is probably produced by the hydration of a colloidal, gelatinous mass surrounding the asci. The optimum temperature for germination of spores and growth occurred at 10–18°C.—*E. L. Fisk.*

6172. Helvestine, Frank, Jr. **Amitosis in the ciliated cells of the gill filaments of Cyclas.** Jour. Morphol. 36: 103–117. *Pl. 1–2.* 1921.—It is shown that the ciliated cells of the lamellibranch, *Cyclas*, appear to have no centrosome and divide exclusively by amitosis, thus supporting the hypothesis that the basal bodies of the cilia are derived from centrosomes. No genetic connection between mitochondria and cilia could be found.—*Ernst A. Bessey.*

6173. Huettner, Alfred F. **Maturation and fertilization in Drosophila melanogaster.** Jour. Morphol. 39: 249–265. *Pl. 1–3, fig. 1.* 1924.—The majority of eggs show polyspermy, several sperms entering the anterior end of the egg, the largest number found being 30. These supernumerary sperms are soon digested, but the tails may remain stainable for a long time. At the time of entry of the 1st sperm the egg nucleus is in the metaphase stage. Without the entry of the sperm the nuclear division does not progress further, but as soon as a sperm enters the egg the spindle elongates and the chromosomes become separated into a group of 8 at each pole of the spindle. New spindles are formed at once and these groups of 8 chromosomes divide to form the 4 haploid nuclei, of 4 chromosomes each. Meanwhile the sperm head has moved to the center of the egg and has formed a conspicuous aster around the centriole, which soon becomes double. The 3 polar nuclei and the egg nucleus organize as resting nuclei, the latter taking a more central position close to the sperm nucleus, whose aster has almost disappeared and which is now in the resting state. The chromosomes of the polar nuclei reappear and 2 of these fuse to form a diploid nucleus with which finally the 3rd polar nucleus fuses, making a triploid nucleus in which all the chromosomes now show a split. They arrange themselves as 9 radiating pairs of larger chromosomes around the 3 smallest pairs. Meanwhile the male and female nuclei lose their membranes and reveal 4 chromosomes in each. Each group has its own spindle, focusing at each end in a common centriole. The 2 chromosome groups remain distinct until the close of the telophase. At no stage is there any evidence of the transverse fragmentation of chromosomes as has been suggested in explanation of certain genetical phenomena.—*Ernst A. Bessey.*

6174. Martin, Ella May. **Cytological studies of Taphrina coryli Nishida on Corylus americana.** Trans. Wisconsin Acad. Sci. 21: 345–356. *2 pl.* 1924.—*Taphrina coryli* Nishida is an intercellular parasite infecting leaves and the cortex of 1-year-old twigs of *Corylus americana*. Vegetative cells are binucleate, and this binucleate condition continues into the ascogenous cells where nuclear fusion takes place. The division of the fusion nucleus is a heterotypic division. Definite spindles and centrosomes are found, though it is difficult to recognize individual chromosomes in the chromatin masses. The separation of the basal cell from the ascus proper is initiated by the constriction of the plasma membrane. One nucleus is left in the basal cell and the other passes into the ascus proper. The nucleus in the basal cell disintegrates, but that in the ascus and its derivatives divide to form the nuclei of the 8 primary spores. Vacuolar membranes are active agents in delimiting the primary spores. These spores "bud" to form conidia which may continue the process of "budding," or may produce short hyphae on artificial media.—*Author.*

6175. Rhode, Emil. **Der plasmodiale Bau des Tier- und Pflanzenkörpers. [The plasmodial structure of animal and plant bodies.]** Zeitschr. Wiss. Zool. 120: 325-535. 1923.—The conception of the cell generally accepted at the present day, the author (following Heidenhain, 1907) formulates in the Introduction as follows: (1) All living substance is con-

fined to cells. (2) The cellular structures of the body represent the same level of organization or individuation. (3) The tissue cell is from the morphological and physiological view-point an elementary organism (individual). (4) The animal (or plant) body is an aggregate of cells and the cells are the structural units of the body. (5) In accordance with the principle of the division of labor, the activity of the body as a whole is the sum of the individual activities of the different classes and kinds of cells (The theory of the cell state of colony). (6) The tissue cells are the direct descendants of the embryonic cells, themselves derived by cell division from the fertilized egg cell (Omnis cellula e cellula).—All of these generalizations the author, in the 3rd division of the paper (Results), specifically denies: The structure of the body is plasmodial not cellular. Cells are not always derived from preëxisting cells. The Metazoan (Metaphyte) body is not structurally an aggregate of cells, nor is it to be thought of as a cell colony. The cell is a secondary, not a primary, structural entity. The tissue cells are not morphologically equivalent as representing the same level of organization or individuation, but are markedly diverse in the stage of differentiation that they exhibit. Cells may be formed in quite diverse ways. Finally, the living substance exists not only as protoplasm but as metaplasm.—In substantiation of these conclusions the author, in the 2nd division of the article (Special part), reviews the structural organization of a large number of forms. Beginning with the lower, purely plasmodial plants among the algae and fungi, he passes to a review of the plasmodial origin of cells in the development of higher as well as lower plants. The plasmodial formation of cells (including germ cells) in animals is considered in detail and the fundamental syncytial character of the embryonic and differentiated tissues in higher animals is emphasized. Each tissue group is examined and its structural plan critically considered.—*B. E. Kingsbury.*

6176. Ruys, Jan Daniel. **[1] Contribution à l'histoire du développement des Mélastomatacées. [2] Enumération des plantes phanérogames angiospermes examinées an point de vue de la karyologie. [Contribution to the developmental history of Melastomataceae. Enumeration of the angiosperms which have been studied from the point of view of karyology.]** *vi + 123 p. Pl. 1–3.* E. J. Brill: Leiden, 1925.—Material of the Melastomataceae preserved in alcohol, from the large collection made by Treub (1910) in the Dutch East Indies, was made available to the author for study. This was supplemented by material from the East and West Indies and from the botanical gardens at Buitenzorg and at Utrecht. In material fixed by the author, Fleming & Juel's Carnoy were used, the latter giving best results. Heidenhain's hematoxylin gave better results than safranin and gentian violet. The methods used are given in detail. In the historical introduction the studies of this family by Hoffmeister, Mellink, and Tassi are briefly reviewed. As a result of the present investigation the author finds that the development of the haploid generation in the Melastomataceae is entirely normal. The embryo sac of *Mouriria anomala* Pulle in which the endosperm is already formed has haustoria which cause the destruction of the nucellus. In the metaphases of kinesis in the endosperm there are groups composed each of 3 chromosomes.—The haploid number of chromosomes in *Bertolonia marmorata* and *Miconia racemosa* is 12; in *Triuranthera Winkleri*, 24. The diploid number in *Memecylon floribundum* and in *Mouriria anomala* is 24.—In Part 2 the author lists all the angiosperms in which studies have been made of the embryo sac development, development of pollen, reduction divisions, and vegetative divisions—which together comprises the karyology. Teratological data and studies of the physical and chemical nature of the nucleus are not included. The plant list follows Engler's system and gives in each case the plant name, the authors who have studied it and the dates of publication.—A literature list covers 47 pages.—*Frederick V. Rand.*

ECOLOGY

Geo. D. Fuller, *Editor*

(See also in this issue Entries 6149, 6168, 6242, 6287, 6309, 6345, 6360, 6378, 6404, 6412, 6413; 6424, 6431, 6433, 6487, 6493, 6542, 6548, 6617, 6618, 6632, 6634, 6645, 6677, 6681, 6700, 6761, 6776, 6784, 6786, 6789, 6803)

GENERAL, FACTORS, MEASUREMENTS

6177. Anonymous. [Rev. of: Gardiner, J. Stanley, and A. G. Tansley, Editors. **The natural history of Wicken Fen. I.** Bowes & Bowes: Cambridge, 1923.] Nature 112: 554. 1923.—This is a notice of the appearance of Part I of this series of papers which is to continue until the volume is completed. The project is a very desirable record of public spirited action by entomologists and botanists supported by the National Trust for Places of Historic Interest or Natural Beauty. The volume now begun is to record the history and biology of the fenland. The present part contains A. H. Evan's history of the fens, with special reference to Wicken Fen, and of their drainage and its effect on the fauna and flora; and an account of the butterflies and moths of Cambridgeshire, by W. Farren.—*Frederick. V Rand.*

6178. Allen, W. E. **Observations on surface distribution of marine diatoms of Lower California in 1922.** Ecology 5: 389–392. *1 fig.* 1924.—The results were in general: (1) Areas of heavy production were found in unexpected places, (2) greater production was nearer shore than seaward, and (3) pelagic diatoms have very wide distribution.—*T. J. Fitzpatrick.*

6179. Atkins, W. R. G. **On the vertical mixing of sea water and its importance for the algal plankton.** Jour. Marine Biol. Assoc. United Kingdom n.s. 13: 319–324. *Fig. 1.* 1924. —The author's summary is: "(1) Measurements of H-ion concentration, of phosphate concentration, and of temperature all show at certain seasons a well-marked gradient from surface to bottom. The upper 10–20 m. is more alkaline, notably depleted of phosphates, and warmer. (2) Settled summer weather and deep water, free from irregularities of the bottom, favor the formation of such a gradient. Its breaking up is occasioned by wave action and the cooling of the surface water in autumn. (3) Thermal stratification in the English Channel arises at each station, and is not due to the inflow of warm over colder water."—*Marshall A. Howe.*

6180. Børgesen, F. **Et Besøg i Jamaicas Bregneskove.** [A visit to the fern forests of Jamaica.] Nat. Verden 7: 304–313. *4 fig.* 1923.

6181. Cannon, W. A. **A note on the relation of root growth in the soil to the oxygen supply: the growth ratio.** Ecology 5: 319–321. 1924.—Under constant conditions of a low oxygen supply, other factors being equal, the value of the growth ratio of roots varies inversely with temperature. "At constant temperature its value varies directly with the oxygen partial pressure, provided the latter is small." *Zea mays*, for example, in 3% oxygen, shows a ratio of about 0.35 at 17°C., about 0.2 at 23°C., and about 0.06 at 30°C. *Allium cepa, Citrus medica* var. *limon, Opuntia versicolor, Pisum sativum, Gossypium hirsutum,* and *Potentilla anserina* show analogous reactions. *Zea mays* at 17°C. showed a growth ratio of 0.66 in 3.6% oxygen and about 0.98 in 10% oxygen. In *Prosopis velutina,* at 20°C., the growth ratio was 0.14 in 0.6% oxygen, 0.33 in 0.8% and 0.71 in 2.2%. Other experiments indicate that this condition is general. However, if the increased oxygen supply greatly exceeds the absorption capacity of water there may not be an increase in the growth rate.—*J. E. Weaver.*

6182. Clements, Frederic E., and Glenn W. Goldsmith. **The phytometer method in ecology: the plant and community as instruments.** Carnegie Inst. Washington Publ. 356. *vi + 106 p. 11 pl., 45 fig.* 1924.—This publication reports studies of the environmental conditions that influence plant growth, these conditions being described in terms of growth, transpiration and other physiological rates that can be secured by intensive observation of phytometers (certain plant individuals or small groups of plants established either in suitable pots or in the open soil). Physical instruments and methods were also employed. The phytometer measurements are calculated to describe the environment as it actually influences the plants used, being automatically and physiologically integrated and weighed

indices of the corresponding efficiency values of the environmental conditions. The authors classify and name various sorts of phytometric cultures for different purposes. Some of the influential conditions or groups of conditions may be maintained or artificially prevented from exceeding certain limits, as when the cultures are artificially watered, etc., and by such modifications the natural environmental complex may be rather extensively and satisfactorily analyzed.—Phytometric studies are reported for the period, 1918–1924, carried out in the vicinity of Pike's Peak, Colorado, and also in Nebraska and Kansas. "The six years of experience with the phytometer method in a wide variety of forms and applications justifies the conclusion that it is indispensable to all quantitative and objective studies. Its sole limitation is the labor and expense involved and this applies chiefly to growth phytometers carried out on a large scale for the entire season. Even with these, the operation is within the capacity of a single investigator when growth is expressed in yield or dry weight for the whole season, and this is much truer of short-period phytometers utilizing a single function, such as transpiration."—*B. E. Livingston.*

6183. Clements, Frederic E., and John E. Weaver. **Experimental vegetation: the relation of climaxes to climates.** Carnegie Inst. Washington Publ. 355. *vii + 172 p. 15 pl., 41 fig.* 1924.—This book reports results of correlated climatic, soil and plant studies, carried out from 1918 to 1924 at stations as follows: Nebraska City, Nebraska (subclimax prairie, rainfall 33 inches); Lincoln, Neb. (true prairie, rainfall 28 inches); Phillipsburg, Kansas (mixed prairie, rainfall 23 inches); Burlington, Colorado (short-grass plains, rainfall 17 inches). The Lincoln station comprised several substations for study of soil conditions, including preclimax short-grass, high prairie, pastclimax low prairie, swamp, and salt-flat.—Experimental methods comprised sowing of seed on denuded as well as undisturbed areas, introduction of greenhouse-grown seedlings, and transplanting of mature sods from one community to another. Transpiration and growth were studied by means of potted plants and lifted sod-cores. By clip-quadrats, total growth was determined for the natural associations and also for several cultivated crops. Growth indices were progressively greater eastward; transpiration values were progressively greater westward.—It is concluded that the grasslands are a single formation, composed of closely related associations, while the tall-grass prairie (rainfall 33 to 40 inches) is really subclimax, the corresponding climax being deciduous forest.—*B. E. Livingston.*

6184. Dahl, Knut, Johannes Lid, and T. Munster. **A division of Norway into bio geographical sectional areas agreed upon by botanists and zoologists.** Videnskapsselskap. Cristiania Skrifter. I. Mat. Nat. Kl. 7. *1–18. 1 map.* 1924.—The opinion of biologists being very general that the political province borders are not very good for circumscribing the areas of specific distributions in Norway, a meeting took place on the initiative of Münster, and a committee was appointed. The committee, taking all factors regulating the distribution of plants and animals in consideration as far as possible, finally proposed a division of Norway into 41 sectional areas, the boundaries of which are described in detail in the paper. It is understood that for certain groups or for very special investigations the divisions might be different, but for general use the scheme was agreed upon by all Norwegian botanists and zoologists. Finally, a method for practical tabulation of records of the frequency and altitudinal distribution of the species in each sectional area was adopted and is recorded in the present paper.—*K. Münster Strøm.*

6185. Fred, E. B., F. C. Wilson, and A. Davenport. **The distribution and significance of bacteria in Lake Mendota.** Ecology 5: 322–339. *3 fig.* 1924.—The study was to ascertain the number of bacteria at different depths and at different seasons. The article includes methods of work, tables of counts, and general characteristics of Lake Mendota. Samples of water were taken at different depths and counts made every week or 2 for the period between 1917 and 1922. The total number was found to be comparatively small and rather uniformly distributed except in the deepest layers where there is little or no oxygen. There were periodical fluctuations caused by season, rainfall, wind, temperature, the physical and chemical condition in the water, and the flora present. There is considerable variation in bacterial content even under like or similar conditions in rainfall and drainage. Food supply is sufficient to support more bacteria than were found, but the limiting factor was not ascertained.

Temperature does not hinder multiplication of lake bacteria and sunlight apparently has no inhibiting effect on the number.—*T. J. Fitzpatrick.*

6186. Glerum, O. Nogle undersøgelser over luftvekselen og telesmeltningen i jorden. [Investigation of air-movement and melting of subsoil-ice.] Nordisk Jordbrugsforskning 1923: 208–220. 1923.—The observations were made on a Norwegian state farm near Trondjhem on loam with a subsoil of marine clay. The soil can be divided into 3 layers with the air change decreasing downwards, incurred by the annual rise and fall of the ground water. The 3rd layer, in which the air change is dependent on the currents of ground water, extends beyond the bottom of the ditches. Moving animals or humans on the surface of the field cause a considerable movement of air in the superficial layers of soil. This is even more conspicuous under the processes of cultivation. In a well ditched field the subsoil ice is mainly formed by freezing of capillary and hygroscopic water and little or no hydrostatic water is given off by thawing. On the other hand the ice formed in the upper 5–8 inches of soil yields melting water in the spring.—The topic is treated in detail in: Beretning om statens forsøksgaard paa Vold 1919 [Rept. Norwegian State Expt. Farm, Vold, 1919].—*Ernst Gram.*

6187. Gleason, H. A. **Species and area.** Ecology 6: 66–74. 1925.—Arrhenius' equation, $\frac{\text{Area}}{\text{Area}} = \frac{\text{Species 1}^n}{\text{Species 2}}$, is approximately true for areas of small size but gives too high values for large areas. Quantitative studies were made during the summer of 1923 in the aspen association in the vicinity of the Biol. Sta., Univ. Michigan. Eight sets of statistical data were secured. From a study of these the following equation was formulated to express the relation between species and area:

$$\frac{\log B - \log A}{\log C - \log A} = \frac{b - a}{c - a},$$

where areas A and B are representative portions of area C and these areas contain the number of species a, b, and c respectively. The values for A, B, a, and b may be taken or observed in the field and from these values c may be estimated. This equation, on being tested in 5 selected tracts in the aspen association, gave surprisingly close results. Similar tests were made in the beech-maple forest and gave dependable results. The general conclusion is drawn that in a single plant association the environment is essentially homogeneous for each species, distribution being controlled by chance and accidents of dispersal, and that the number of individuals of a species of an area is an index of its adaptation to the environment.—*T. J. Fitzpatrick.*

6188. Jespersen, P. **On the quantity of macroplankton in the Mediterranean and the Atlantic.** Rept. Danish Oceanogr. Exped. 1908–1910. No. 7, 3^3: 1–17. *8 fig.* 1923.—The volume of the plankton is given on charts, showing the quantity-average and the number of hauls for each area and depth. Comparison is made with the results of other expeditions.—*Wm. Randolph Taylor.*

6189. Korstian, C. F. Some ecological effects of shading coniferous nursery stock. Ecology 6: 48–51. 1925.—Seedlings of *Picea engelmanni* and *Pseudotsuga taxifolia* were given $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ shade by means of lath screens. When both survival and vigor of the plants were considered, $\frac{1}{2}$ shade was found to be best for both species. Too much shade may prolong the growing season so as to cause danger from early frosts or may produce tall and slender plants which are undesirable for transplanting. In July, the osmotic pressure of the leaf sap of 3-year-old seedlings of Douglas fir was 16.7 atmospheres for the $\frac{1}{2}$-shaded plants and 19.1 for the unshaded. The shaded leaves showed the usual structural differences when compared with the unshaded ones. The practical application is made that nursery stock should be "grown specifically for the particular field site where it is to be used."—*Herbert C. Hanson.*

6190. Nichols, George Elwood et al. **Organic adaptation to environment.** *xviii + 312 p. Pl. 1–6, fig. 1–34.* Yale Univ. Press: New Haven, 1924.—Titles and authors of the 8 chapters of this work are as follows: (1) The terrestrial environment in its relation to plant life, by George Elwood Nichols; (2) The protozoa and the problem of adaption, by Lorande Loss Woodruff; (3) Environment as a stabilizing factor, by Alexander Petrunkevitch; (4) Mutation and environment, by Wesley Rosewell Coe; (5) Fossil plants as evidence for

resistance to environment, by George Reber Wieland; (6) Phases of Celpalopod adaptation, by Carl Owen Dumbar; (7) Dinosaurian climatic response, by Richard Swann Lull; and (8) Environmental and racial character, by Ellsworth Huntinton.—The introduction is by Malcom Rutherford Thorpe, editor of this collected series of lectures based on original research. He says: "In this volume then, for apparently the first time, are considered together adaptations from the evidence of both living and fossil forms."—For abstracts of (1) and (5) see Bot. Absts. 14, Entries 4556, 4559. In chapter 3, Petrunkevitch says that "'Normal' development and 'normal' morphological structure can not be . . . . attributed to the structure of the germ plasm alone . . . . its further fate, its mode of development and its ultimate characters, whatever their hereditary value, are dependent upon, and in a way are a function of the environment." The influence of stabilization works against the formation of new species except in a single possible direction. By a detailed study of several internal parasites the author traces how this result is accomplished and comes to the conclusion that "the living variable system which to our senses appears as an organism and the plan of whose structure we conceive as species, in the unceasing interplay of forces with its environment owes its distinctive characters to the stabilizing influence of the latter."—In chapter 4, Coe inquires into the causes underlying the origin of new varieties of plants and animals and attempts to explain as completely as possible in the present state of our knowledge, the mechanism involved and its reaction to the environment. His discussion is grouped under the following subheadings: Mechanism of mutation (by change in the gene, by non-disjunction of chromosomes); cause of mutation (environmental effects and heredity, is evolution completed?); rate of mutation; direction of mutation (progressive, regressive); extent of mutation; types of mutation (physiological, sex-linked lethal, color, polydactyly, syndactyly, zygodactyly); origin of adaptations (mimicry, artificial selection, origin of species). The chapter ends with the following: . . . "the theory of chance mutation is quite sufficient to account for *all* organic evolution under such environmental conditions as select now one, now another of the countless mutations for survival.—Environment permits and directs evolution but does not cause it." . . . —*Frederick V. Rand.*

6191. Nordhagen, Rolf. **Om homogenitet, konstans og minimiareal. Bidrag til den plante sociologiske diskussion. [Homogeny, constancy and minimi-areals. A contribution to the discussion of plant sociology.]** Nyt Mag. Naturvidensk. [Kristiania] **61**: 1–51. 1922.—In the present paper the author endeavors to clear up some of the fundamental problems of plant sociology, as understood by Scandinavian botanists. He strongly emphasizes the facts that many of the methods still employed are far from being objective enough, and that the questions which the plant sociologists try to solve are not clearly enough defined. The use of sample areals of defined size is fundamental and essential for real comparisons and exact diagnoses. He further formulates the main problems in plant sociology in the following manner: Why do certain species occur in a more or less homogeneous mixture in certain localities, but not in other locations? Why does a species occur in certain localities and in community with certain species with a particular and often great abundance of individuals, when it is absent in other localities or occurs in quite another individual abundance? Which factors regulate the distribution of a species under optimum conditions? Why are certain species much scattered even under seemingly optimum conditions, whereas others are conspicuous by their great density? Why do certain species occur unevenly distributed or quite accidentally in an otherwise more or less homogeneous plant aggregate?—*K. Münster Strøm.*

6192. Rickett, H. W. **A quantitative study of the larger aquatic plants of Green Lake, Wisconsin.** Trans. Wisconsin Acad. Sci. **21**: 381–414. 1924.—This investigation was made to determine the quantities of large aquatic plants produced by this body of water, and to give information on the distribution of various plants and their depth relations. The flora included Potamogeton, *Radicula aquatica*, *Drepanocladus pseudo-fluitans*, *Castalia*, and *Nymphaea*. *Chara* was especially abundant. *Vaucheria tuberosa* was found in 1 place in large quantities and at a depth of 6.5 m. Comparisons are made with the flora of Lake Mendota, formerly investigated in the same manner, as to nature and distribution of plants. Wet and dry weights of various species in different depth zones (0–1 m., 1–3 m., 3–8 m.) were determined.—*E. L. Fisk.*

6193. Singh, Bhola Nath. **On the use of the Bates evaporimeter and evaporimeters in general in studies on plant transpiration, especially in the open air.** Jour. Indian Bot. Soc. 4: 149–179. *4 fig.* 1924.—A record was made of the temperature of the contained water and of the hourly rate of evaporation from a Bates evaporimeter and from a shallow aluminium pan, in sun and in shade, in moving and in still air, and on different days, observations being made several times daily between morning and evening. Evaporation data so obtained were compared with the actual transpiration from potted Jasmine plants. The 3 evaporating surfaces were found to be affected differently by changes in the rate of air movement. Transpiration and evaporation did not always vary in the same direction or to the same extent, thus showing the effect of internal forces influencing transpiration. "It is concluded that a simple method is yet to be devised for obtaining an idea of the absolute amount of transpiration in the open field for oecological purposes."—*F. E. Denny.*

6194. Thompson, P. **Der Einfluss der Gaseruptionen auf die Oberflächenform der Hochmoore.** [The effect of gas eruptions on the surface of moors.] Mez, Bot. Archiv 8: 1–2. 1924.—Water filled trenches in high moors, termed "Schlenken," may be caused by gas eruptions.—*Carl Mez (transl. by Wm. Seifriz).*

6195. Thone, Frank. **Rainproofing valves for atmometers: a résumé.** Ecology 5: 408–414. *2 fig.* 1924.

STRUCTURE, BEHAVIOR, SYMBIOSIS

6196. Blum, August. **Beiträge zur Kenntnis der annuellen Pflanzen.** [Annual plants.] Mez, Bot. Archiv 9: 3–36. 1925.—The author enumerates the length and the dates of flowering periods in the life cycle of annuals. The percentage of 1- and 2-year and of perennial plants found in ecologically different localities are enumerated. The effect of climate and of man on the origin of annuals is considered.—*William Seifriz.*

6197. Holttum, R. E. **Mosquito larvae in pitchers of Nepenthes.** Gard. Bull. Straits Settlements 3: 283. 1924.—A short note is given on our present knowledge of this matter.—*R. E. Holttum.*

6198. McLuckie, John. **Studies in symbiosis I. The mycorhiza of Dipodium punctatum R. Br.** Proc. Linn. Soc. New South Wales 47: 293–310. *26 fig.* 1922.—*Dipodium punctatum* is a holosaprophytic non-green orchid which grows in the humus under Eucalypts. The cortex of the fleshy succulent roots contains an endophytic fungus which forms close coils in the cytoplasm and in the vicinity of the nucleus. Starch is present in the uninfected host-cells, but disappears soon after the penetration of the fungus. The central hyphae gradually become disorganized, all structure disappearing. The nucleus and nucleolus of the host-cell enlarge. When the hyphae are completely digested, droplets of a yellowish waste matter remain. Certain of the hyphae grow into neighboring cells if these are not already infected. No sporangioles, bladders or vesicles develop upon the hyphae as in *Thismia.* The penetration of the hyphae from cell to cell, and from the soil into the root is probably the result of a chemotropic stimulation due to the presence of a nutritive substance such as sugar in the host-cells. The fungus obtains carbohydrate from the host-cell; when it is disorganized the host-cell receives proteid. The absence of root-hairs and the lack of chlorophyll seem to suggest that the host receives all its requirements directly or indirectly from the fungus, the "symbiotic saprophytism," having practically become a case of the higher plant being parasitic upon the endophyte.—*Eloise Gerry.*

6199. McLuckie, John. **Studies in symbiosis, II. The apogeotropic roots of Macrozamia spiralis and their physiological significance.** Proc. Linn. Soc. New South Wales 47: 319–328. *14 fig.* 1922.—"Root-tubercles," somewhat similar to those of *Cycas revoluta,* occur upon many of the seedlings and older plants of *Macrozamia spiralis,* particularly about the soil-level. The tubercles are seldom present upon the more deeply situated secondary roots, but may be induced to develop by artificial inoculation. The tubercles are always negatively-geotropic and occasionally branch dichotomously. The growth of the root tubercles is due to infection by soil bacteria, of which 2 forms are generally present in the sheath and cortical cells. Zoogloea-threads of bacteria arise in many cells of the cortex, and the bacteria are

frequently crowded in the vicinity of the nucleus. The starch-content decreases in the cells containing bacteria, and is probably used by them in the process of nitrogen fixation. Occasionally, unicellular algae may be present among the outer disorganized cells of the sheath, but there is no definite "algal-zone" as in *Cycas revoluta*. The bacteria assimilate free nitrogen and render it available in a combined form for the plant. The structure of the tubercles also indicates that they may function subsidiarily in aeration. Similar root-tubercles occur in other species of *Macrozamia*, for example, *M. corallipes*.—*Eloise Gerry*.

6200. Pearson, G. A. **Studies in transpiration of coniferous tree seedlings.** Ecology 5: 340–347. 1924.—Experiments were conducted on 2- to 5-year- old seedlings of *Pinus scopulorum*, *Pseudotsuga taxifolia*, *Pinus aristata*, and *Picea engelmanni* in northern Arizona. Sealed galvanized iron pots, 25 cm. deep and 23 cm. in diameter at the top, were used. The transpiration was measured by weighing. The most effective method of expressing comparatively the amounts of transpiration is in terms of water-loss per unit of increment in dry weight. This water requirement was 359 in 4-year-old *Picea Engelmanni*, 381 in 4-year-old *Pseudotsuga taxifolia*, 395.7 in 2- or 3-year-old *Pinus scopulorum*, and 440 in *Pinus aristata*. The wilting coefficient varied only slightly in the 4 species.—*Herbert C. Hanson*.

6201. Pessin, L. J. **An ecological study of the polypody fern Polypodium polypodioides as an epiphyte in Mississippi.** Ecology 6: 17–38. 1925.—The chief climatic factors influencing the distribution of *P. polypodioides* is the evaporating power of the air, the growth of the fern being entirely prevented by high evaporation. *Quercus stellata*, *Ulmus americana*, and *Juniperus virginiana* give the best support, and on these the fern was found in abundance. A deeply furrowed soft bark, which retains the water well, furnishes the best substratum. Most of the fern's nitrogen is secured from the humus that has accumulated in the crevices of the bark. Where the humus has a high nitrogen content the fern grows luxuriantly; where the nitrogen content is low the fern grows poorly. The other mineral elements are derived mostly from the dust of the air. The ferns occur in equal abundance on barks showing an acid reaction as on those showing neutral or alkaline reactions.—*J. E. Weaver*.

6202. Rivett, M. F. **The root-tubercles in Arbutus unedo.** Ann. Bot. 38: 661–677. *14 fig.* 1924.—The root-tubercles of *A. unedo* are shown to be the arrested secondary and successive laterals of the season's growth. This arrest of growth is due to the invasion of a fungus, first as a rampant ectotroph and subsequently as an endotroph in the peripheral cells. The invasion of the fungus is limited by the digestive action of the host-cells of the tubercle, which may be regarded as "phagocytes," the interchange of food materials between host and endophyte seems to be very slight and does not afford permanent mutual benefit. The relationship is regarded as one of balanced parasitism, and the action of the tubercles is effective in conferring a degree of immunity on the root system as a whole.—*M. Newton*.

6203. Robertson, C. **Phenology of entomophilous flowers.** Ecology 5: 393–407. 1924. —This paper presents a summary of observations made from 1884 to 1913 upon 470 indigenous and 54 introduced entomophilous species. A variety of other topics, hereditary influences, blooming seasons and specialization, blooming seasons and geological succession, blooming seasons and competition, are also discussed.—*Herbert C. Hanson*.

6204. Szidat, L. **Die Samen der Bromeliaceen in ihrer Anpassung an den Epiphytismus. [The adaptation of Bromeliad seed to the epiphytic habit.]** Mez, Bot. Archiv 1: 29–46. *9 fig.* 1922.—Two groups of adaptive factors make possible the epiphytic habit of many Bromeliads. These are, the ability to absorb atmospheric moisture, and the development of seed adapted to sowing on tree branches.—*Carl Mez (transl. by William Seifriz)*.

VEGETATION

6205. Conard, H. S. **Second survey of the vegetation of a Long Island salt marsh.** Ecology 5: 379–388. 1924.—The 1st survey was made in 1909–1910. The 2nd survey shows that the fresh water vegetation (*Aspidium*, *Lysimachia*, *Scirpus*, *Typha*, and *Onoclea*) has greatly extended out upon that of the salt marsh (*Spartina*, *Juncus*), while the latter has retreated. In the salt marsh, *Juncus gerardi* has extended at the cost of *Spartina patens*, the former being less salt-tolerant. These changes are due probably to seepage of fresh water and the excessive precipitation of the last few years. Other changes are: Several annuals have dis-

appeared or become greatly reduced, *Iva oraria* and *Hibiscus moscheutos* have greatly increased in numbers, and many mud flats have disappeared.—*Herbert C. Hanson.*

6206. Holttum, R. E. **The vegetation of Gunong Belumut in Johore.** Gard. Bull. Straits Settlements 3: 245–257. *3 pl.* 1924.—The vegetation lying between 2800 feet altitude and the summit (3320 feet) of the mountain is described. It consists of a thick low mossy forest containing principally *Eugenia* spp., and a scrub in which the principal plant is *Matonia pectinata*. In the forest the trees are thickly covered with bryophytes, chiefly liverworts, the most abundant species being *Mastigophora diclados* Brid. Measurements of trees are given and comparison is made with other similar vegetation.—*Author.*

6207. Laing, R. M. **The vegetation of Banks Peninsula: Supplement 1.** Trans. and Proc. New Zealand Inst. 55: 438–444. *Fig. 1–3.* 1924.—The forest in Prices Valley of Banks Peninsula contains one of the remnants of lowland forest. Characteristic of the district are *Podocarpus totari* and *P. Hallii*, *Nothopanax anomalum*, *Teucridium parviflorum* and *Pseudopanax ferox*. A list of 45 plants to be added to the record from the district is given and a list of errata is included. *Myosotis australis* R. Br. var. *lytteltonensis* Laing & Wall is described as new.—*Wm. Randolph Taylor.*

6208. Okada, Yoonosuke. **On the so-called tundra formation of North Saghalien.** Bot. Mag. Tokyo 38: 76–83. *5 fig. map.* 1924.—This formation covers large areas and consists of (1) forests of *Larix dahurica* with an undergrowth of ericaceous and other shrubs, *Spiraea* spp., *Osmunda cinnamomea*, *Sphagnum* spp., and *Polytrichum* spp.; (2) dwarf shrub associations over a layer of sphagnum, the principal shrubs being *Vaccinium* spp., *Andromeda polifolia* and *Oxycoccus palustris;* (3) high-moor with sphagnum and a few shrubs; (4) low-moor dominated by grasses and sedges and; (5) moss tundra with abundant *Sphagnum* spp., some *Vaccinium Vitis-idaea*, *V. ovalifolium* and *Rubus chamaemorus.*—*Geo. D. Fuller.*

6209. Uphof, J. C. Th. **Ecological observations on plants of the marshes and swamps of central Cuba.** Ecology 5: 363–371. *2 fig.* 1924.—Studies were made of brackish and fresh water marsh and swamp formations in the provinces of Habana, Matanzas, Santa Clara, and Pinar del Rio. Various factors or physical conditions which modify the habitats are mentioned. Analyses of many plant associations are given along with an enumeration of the dominant species.—*T. J. Fitzpatrick.*

FLORISTICS

6210. Anonymous. **Excursion to the Brisbane Ranges.** Victoria Nat. 41: 164–166. 1925. —Plants to the number of 400 were observed, including 16 species of *Eucalpytus* and 13 of *Acacia;* some of the plants observed are listed.—*Wm. Randolph Taylor.*

6211. Anonymous. **Excursion to Waterfall Gully, September 6, 1924.** South Australian Nat. 6: 13. 1924.—Flowers noted, especially *Drosera*, are mentioned.—*Wm. Randolph Taylor.*

6212. Abrams, LeRoy. **The origin and geographical affinities of the flora of California.** Ecology 6: 1–6. 1925.—The flora of the higher mountains is boreal in origin, and made up chiefly of genera common to northern North America and Eurasia. The flora of the deserts is largely of Mexican origin. The flora of the cismontane region, which is typical California, is composed of both these elements together with many endemics and relics. This region has possessed an oceanic rather than a continental climate since the Cretaceous, and consequently its flora was less disturbed than in the eastern U. S. A. by the great climatic changes of Tertiary time, hence, such relics as sequoias and tumions. The antiquity of the flora is also seen in its affinities with southern Asia, the Mediterranean region, and the antipodes.—*Author.*

6213. Courvoisier, J. **Le "problème" des stations des diatomées en Suisse. [The problem of diatom stations in Switzerland.]** Bull. Soc. Vaudoise Sci. Nat. 54: 445–446. 1921–1922 [1923].—Some students of diatoms believe that the wind may be one of the principal agents for dissemination of dormant spores of certain diatoms. Large water courses may also aid in their transport if one admits the hypothesis that aquatic birds may well have a direct part in dissemination. The new stations in Switzerland appear to be made up exclusively of species of diatoms from the country to the north. The author explains this circumstance by the fact that several species of ducks and geese feed on algae which often have a muscilaginous en-

velope. In their southward migrations they make stopping places from lake to lake or other water course. At this season the mountain lakes are not yet frozen and scraps of algae thus transported may at once spring into life in their new environment. In the writer's opinion this is why the diatoms found in new Swiss stations are nearly always species of the North.—On the other hand, at the time of the northern migration in spring, the lakes are still frozen over and the birds are thus unable to use them as stopping places.—In some cases man has also served as the agent of dissemination for diatom species; examples are given.—*Frederick V. Rand.*

6214. Daley, C. **Around Noojie.** Victoria Nat. 41: 166–183. 1925.—An extensive list of plants present is given. A discussion of the physiographic and economic results of forest denudation is given with a survey of the characters of the vegetation along the railroad.—*Wm. Randolph Taylor.*

6215. De Wildeman, É. **A propos des cartes forestières de l'Afrique et en particulier du Congo belge. Note préliminaire.** [Maps of African forests with particular reference to the Belgian Congo.] Ann. Soc. Sci. Bruxelles 43[2]: 225–231. 1924.—In connection with "The vegetation and soils of Africa" by Shantz and Marbut, the actual extent of the forests of the Belgian Congo is discussed. The writer agrees with other authorities that the forests of tropical Africa are in a state of decided retrogression and that it is important to carefully protect the existing stands both in order to secure timber production and to conserve the climate and soil conditions. A brief examination is also made of some other floristic zones.—*Author (translated).*

6216. Hutchinson, John. **Notes on East African plants.** Gard. Chron. III. 74: 205, 219. *Fig. 75, 81.* 1923.—Notes are given on plants from an average elevation of 2200 feet and from the coastal plains.—*P. L. Ricker.*

6217. MacGillivray, W. **An excursion in southwest Queensland. Contd.** Victoria Nat. 41: 26–140. *Pl. 5.* 1924.—A general description of the flora and fauna is given.—*Wm. Randolph Taylor.*

6218. Matthews, J. R. **The distribution of certain portions of the British flora. II. Plants restricted to Scotland, England and Wales.** Ann. Bot. 38: 707–722. *5 fig.* 1924.—The author states that 105 species of plants are found in Scotland as well as in England and Wales, but not in Ireland. Of these, 55 show a southern tendency, while the remaining 50 are found most frequently in Scotland. The distribution of the former group is similar to that of those confined to England and dealt with in a previous paper, except that they are more widely distributed. This last fact makes it difficult to determine lines of invasion, but certain details in connection with some of them indicate the south and east coasts as points of invasion and establishment. Some of them show considerable gaps in distribution and this may result in spread from more than 1 center. The majority of the 50 northern species are arctic and are regarded as older than the southern ones.—*W. P. Thompson.*

6219. Mörner, Carl Th. **Statice limonium L. var. hallandica Neum.; status praesens å originalfyndorten.** [The original locality of S. limonium.] Bot. Notiser 1922: 111. 1922.—Stora Utholmen, near Gottskär, Onsala Parish, Sweden, the colony was circular in 1915, and about 3 m. in diameter; in 1921 it had grown to a diameter of 5½ m. Two smaller patches were also found. Dr. C. Skottsberg has also reported the plant from the islands of Känsö and Wargö among Gothenburg's skerries.—*P. A. Rydberg.*

6220. Rodda, A. E. **Excursion to Altona.** Victoria Nat. 41: 189–190. 1925.—Plants in flower are recorded.—*Wm. Randolph Taylor.*

6221. Wein, K. **Nachträgliches zu meiner Arbeit über die Verbreitung von Ventenata dubia am südlichen Harzrande.** [The distribution of Ventenata dubia in the southern Harz mountains.] Mez, Bot. Archiv 9: 295–296. 1925.

6222. Williamson, H. B. **Excursion to Black Rock.** Victoria Nat. 41: 190–191. 1925.—Plants in flower are recorded.—*Wm. Randolph Taylor.*

FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 6140, 6142, 6149, 6189, 6200, 6206, 6207, 6208, 6214, 6215, 6328, 6331, 6351, 6381, 6393, 6487, 6518, 6519, 6523, 6525, 6526, 6542, 6562, 6565, 6567, 6569, 6583, 6617, 6618, 6695, 6729, 6751, 6760, 6781, 6783, 6805, 6807)

6223. Anonymous. **California sugar pine.** Timberman 26[3]: 50–51. *5 fig.* 1925.—This is a brief description of *Pinus lambertiana*, and its discovery by Douglas. Several instances are given of the durability of the wood.—*Duncan Dunning.*

6224. Anonymous. **Proposed Idaho forestry law.** Timberman 26[4]: 209–210, 212–214, 216–217. 1925.

6225. Anonymous. **Saw timber resources of Indian reservations.** Timberman 26[3]: 62. 1925.

6226. Anonymous. **Suggested State reforestation legislation. Text of bill to be introduced in Oregon legislature.** Timberman 26[3]: 227–228. 1925.

6227. Anonymous. **Übersicht des Flacheninhalts und des Holzertrages der Staatsforsten.** [Summary of areas and yield of timber from the State forests (Prussia).] Deutsch. Forstzeitg. 40: 167. 1925.—The yield is approximately 65 cu. feet per acre for the entire productive area.—*W. N. Sparhawk.*

6228. Allen, E. T. **Forest fires as a national menace.** Timberman 26[4]: 50, 146. 1925.

6229. American Tree Association. **Forestry almanac.** *viii + 225 p. 11 fig.* American Tree Association: Washington, D. C., 1924.—This is a compilation of miscellaneous data on forestry in the U. S. A., including a sketch of the development and organization of the Forest Service, brief accounts of the associations interested in forestry and of the schools giving forestry instruction, and short outlines of the forest situation in each state. A chapter is devoted to the forestry of other countries.—*W. N. Sparhawk.*

6230. Atkins, H. C. **Relation of saws to conservation.** Timberman 26[3]: 183–184, 186. 1925.

6231. Barnes, John S. **Relative volume production of redwood sprouts and seedlings.** Timberman 26[3]: 146. 1925.—Full stocking at different ages was calculated by dividing 43,560 by $0.793a$ (the average projected crown area per tree in square feet, reduced to allow for overcapping). Relative stocking was determined by comparing the actual number of trees with this standard. Differences in production between seedlings and more rapidly growing sprouts are shown for age classes of 20–60 years. Factors are given for correcting Bruce's yield tables, when applied to stands with different proportionate representation of sprouts and seedlings than those from which the tables were made. Suggestions are made as to the most desirable spacing for planting.—*Duncan Dunning.*

6232. Blackall, G. P. **The lumber industry of Finland.** Timberman 26[3]: 54, 212. *2 fig.* 1925.

6233. Brazil. Ministerio da Agricultura, Industria e Commercio. Serviço de Informações. **As madeiras do Brasil.** [The timbers of Brazil.] *2nd ed. 28 p.* Imprensa Nacional: Rio de Janeiro, 1918.—Following a brief statement of the economic importance of Brazilian forests, many of the woods are listed, with notes on their distribution, properties, and utilization. Specific weights and resistance to crushing are given for 60 kinds of construction timber.—*W. N. Sparhawk.*

6234. Busse. [Rev. of: Schilling, L. **Betriebs- und Ertragsregelung im Hoch- und Niederwalde.** [Regulation of yield in high forest and coppice.] *47 fig. 1 map.* J. Neumann: Neudamm (Prussia), 1924.] Deutsch. Forstzeitg. 40: 105–107. 1925.

6235. Eidmann, H. **Beobachtungen über Dioryctria splendidella H. Sch.** [Observations on D. splendidella.] Forstwiss. Centralbl. 47: 98–108. *7 fig.* 1925.—The larva of this moth lives on the resin of *Pinus strobus* and possibly also *P. silvestris* and *Picea excelsa.* It is of secondary importance, as it attacks only unhealthy trees, especially those already attacked by *Peridermium.* Its principal enemy is a tachina fly (*Gymnopareia* (*Actia*) *pilipennis.*—*W. N. Sparhawk.*

6236. Eldredge, Inman F. **National forests and national defense.** Military Engineer 16: 274–277. *Illus.* 1924.

6237. Escherich, K. **Eine Reise ins norddeutsche Eulengebiet.** [A trip to the region devastated by the owl-moth in northern Germany.] Forstwiss. Centralbl. 47: 2–20, 53–66. *10 fig.* 1925.—Last year's owl-moth epidemic (*Panolis* (*Noctua*) *piniperda*) covered more than 500,000 ha., and is probably the most extensive insect calamity in the history of German forestry. While a large proportion of the defoliated trees have put forth foliage, the extent of their final recovery is not yet known. The author warns against too optimistic as well as too pessimistic views.—The effect of the red ant (*Formica rufa*) in preventing moth injury to trees is noted, and methods of increasing the number of ant colonies are outlined. Schulz, in Wirschkowitz, has had considerable success along this line.—One of the principal problems of forest entomology is the study of the biological balance and the relation between silvicultural methods and the occurrence of harmful and beneficial insects. Records covering more than 100 years show that owl-moth epidemics follow warm, dry years, usually reaching an acute stage on the 2nd year after such a season, and lasting 1 or at the most 2 years. Differences in intensity of attack in a given season are attributed to local climatic differences and to structural differences in the stands. The abundance of parasites, among which a tachina fly (*Panzeria rudis*) is most important, appears to depend upon the composition of the forest. Yano, in Japan, found 7 times as many parasitic insects in mixed as in pure stands.—Means of combating the moth include the use of swine and chickens, which eat the pupae; cultivation of red ants; propagation of parasitic enemies; dusting with poison from airplanes; and spread of the "polyeder" disease, caused by Chlamydozoa which attack the blood cells of the caterpillars.—*W. N. Sparhawk.*

6238. Escherich, K. [Rev. of: Cecconi, Giacomo. **Manuale di entomologia forestale.** [Manual of forest entomology.] *680 p. 786 fig.* Tipogr. del Seminario: Padova, 1924.] Forstwiss. Centralbl. 47: 47–48. 1925.—This is said to be the 1st comprehensive work on the forest insects of Italy.—*W. N. Sparhawk.*

6239. Fritz, Emanuel, and James L. Averell. **Discontinuous growth rings in California redwood.** Timberman 26[3]: 156, 158, 160. *2 fig.* 1925.—Several 2nd growth redwoods were found in which incomplete rings were produced during periods as long as 19 years, after which the production of complete rings was suddenly resumed. Microscopic structure and probable causes are discussed.—*Duncan Dunning.*

6240. Granger, C. M. **Forestry in Oregon—today and tomorrow.** Timberman 26[4]: 156. 1925.

6241. Griggs, Everett G. **Forest depletion and need for reforestation.** Timberman 26[4]: 169, 170, 172, 174. 1925.—The need for changes in methods of forest taxation are emphasized. A comparison is made with the forest policy of Japan.—*Duncan Dunning.*

6242. Harrer. **Anbau von Exoten.** [Introduction of exotics.] Forstwiss. Centralbl. 47: 49–53, 117–128, 136–148. 1925.—North American trees, particularly *Pinus strobus*, were introduced into Germany toward the end of the 18th century, with the return of the Hessian soldiers who had been employed by Great Britain. There was little further activity in this line until about 1880, when John Booth induced the forest departments of several states to make experimental plantations of exotics. Most foresters have been prejudiced against foreign species, chiefly because of the unsatisfactory results of most of the trials, and some, as Bühler, have even declared that none of these trees should be considered for commercial planting. The author points out that many of the failures resulted from ignoring the silvical requirements of the species, or from the use of seed of wrong climate-races. Growing trees singly or in small groups does not afford a reliable indication of how they will do in large stands, nor can they be expected to thrive when planted on sites or in mixtures to which they are not adapted.—Lists are given of the species that have been tried since 1882 in Prussia, Bavaria, Württemburg, Baden, and Brunswick, classified according to whether they should be considered for planting on a commercial scale, or as secondary species, or for park and decorative purposes. The author questions this classification for the reasons mentioned. He favors more extensive trials of many species, and suggests also the introduction of subordinate plants that commonly grow on the forest floor in the native habitats of the exotic trees.—*W. N. Sparhawk.*

6243. Helms, Joho. **Grankultureme i Borbjerg og Sevel Plantager.** [Culture of spruce in Borbjerg and Sevel plantations.] Forst. Forsogsv. Danmark 6: 87–136. *26 fig.* 1922.—Heath reclamation by the use of spruce is described. Mountain pine was used as a nurse crop. Fertilization was necessary, using lime and cultivation, and also legumes to supply nitrogen after the stand had closed and formed forest conditions that favored the activities of nitrifying bacteria. These plantations established 40 years ago on the most difficult sites prove conclusively that reforestation is possible in all of Denmark.—*T. S. Hansen.*

6244. Hohenadl, W. **Ziele und Methoden der forstlichen Forschung oder "Praktischer Beweis dass die Mathesis bei dem Forstwesen unentbehrliche Dienste tue."** [Goals and methods of forest research—its dependence on mathematical methods.] Forstwiss. Centralbl. 46: 611–625, 655–666, 709–721, 756–767. 1924.—The use of graphic methods in the mathematical analysis of forestry investigations and computations is dealt with, especially the use of "function scales" and logarithmic coordinates in studying the form relationships of trees. Among the facts brought out by these methods are the following: (1) Irregularities in taper curves correspond to opposite irregularities in the dry weight of the wood at the points in question. (2) Form curves show graphically the tendency toward more cylindrical bole with increasing age, except that when a dense old stand is opened up the tendency is in the opposite direction. (3) All form curves of the lower $\frac{1}{2}$ of the stems practically coincide for all trees of the same species, in a given stand, regardless of size. (4) Because of this, form factors related to the same relative height (as $\frac{1}{10}$ or $\frac{1}{2}$, instead of an absolute height, as 1.3 m.) show little variation for trees of different sizes. (5) As the logarithmic increment and yield-curves have about the same shape for all sites, the yields on all sites can be shown by a single curve, by shifting the coordinates. (6) The yields with different degrees of stocking can likewise be shown by shifting the coordinates of a single curve. (7) Logarithmic graphs may be of great value in showing the functional relationships of various factors in trees and stands, and are likely to afford clues to the laws governing the development and structure of stands.—In the 2nd part of the paper are developed 2 methods of computing the volume of stands by means of graphs and statistical formulae. Both formulae are based on a tally of the trees in the stand by diameter classes, and the measurement of 2 stems representing the average plus and minus deviation from the stem of geometric or arithmetic mean diameter. By the logarithmic method, the volume may be obtained by the formula

$$\log V = \log N + \tfrac{1}{2} (\log v_+ + \log v_-) + 0.2878 (\log v_+ - \log v_-)^2,$$

where N is the number of trees, V the volume of the stand, and v_+ and v_- the volumes of the trees of average deviation from the geometric mean diameter; by the arithmetic method,

$$V = \frac{N}{2} (v_+ + v_-)$$

where v_+ and v_- are the volumes of the stems of average deviation from the arithmetic mean diameter. Use of the mean basal area instead of diameter in selecting the trees to be measured gives results varying as much as 4% from actual measured volumes, while the method outlined gives results correct within 0.00–0.44%. The arithmetic method is better for mere measurement of the wood volume of stands, but for scientific purposes, such as statistical comparison of the same stand at different periods, or of different stands of the same or different species and of different ages or composition, the logarithmic method is preferred.—The values and value increments of stands can be studied by similar methods.—*W. N. Sparhawk.*

6245. Holme, John G. **Forest fire insurance in Sweden.** Timberman 26^4: 144. 1925.

6246. Howard, S. H. **General volume tables for sal (Shorea robusta) classified by diameter and height.** Indian Forest Rec. 10^6: 87–144. *8 pl.* 1924.

6247. Hunt, Thomas Forsyth. **Is there a solution to our forest problem?** Timberman 26^3: 177–178, 180. 1925.—The history of forestry in various countries is briefly considered. Saving waste, use of substitutes, and increased timber production are suggested. Regulation of logging is discussed.—*Duncan Dunning.*

6248. Jones, T. W. **Wood products.** *19 p.* Ernest Benn, Ltd.: London, 1924.—This is a brief account of the products obtained from wood by destructive distillation and by extraction, and of the processes employed.—*W. N. Sparhawk.*

6249. Julius, Edward. **Annual progress report upon state forest administration in South Australia for the year 1923–24.** Ann. Prog. Rept. Woods & Forests Dept. South Australia. *11 p. 5 pl. 2 maps.* Adelaide, 1924.—This is the usual administrative report in which the year's work is discussed. The state forests now aggregate 206,109¼ acres. During the year 1,173¾ acres were set aside for planting, bringing the total area thus reserved to 28,217¾ acres. From the nurseries 253,337 trees were distributed to 1964 applicants and 682,139 trees were planted on the state forests.—*C. F. Korstian.*

6250. Kawada, Masaru, and Yosizô Yanagida. (Japanese.) **[Fire injury to trees or forests.]** Zeitschr. Forstbauuntersuchungen (Special number) **1923:** 1–33. 1923.—The paper describes the injury to various kinds of trees by the Tokio fire September 1, 1923. As a rule, the conifers were more severely injured than broad-leaved species. *Pasania cuspidata, Quercus glauca,* and *Fatsia japonica* were most resistant, and *Taonobo japonica* and *Enkyanthus japonicus* least resistant among the broad-leaved trees, while *Ginkgo* trees that had lost all their foliage put out new buds by Sept. 23, and many trees that were killed to the ground sprouted from the base.—*Based on author's German abstract.* (*Courtesy Japanese Jour. Bot.*)

6251. Koehler, Arthur. **The properties and uses of wood.** *xiv +354 p. 129 fig.* McGraw-Hill Book Co.: New York and London, 1924.—"In this book an attempt is made to present in as non-technical a manner as is consistent with clearness and accuracy, the more important facts concerning the properties of wood and how these properties affect its utilization."—*From author's preface.*

6252. Korstian, C. F. **Growth on cut-over and virgin western yellow pine lands in central Idaho.** Jour. Agric. Res. **28:** 1139–1148. *Pl. 1–3.* 1924.—This report presents the 1st important results of a study of growth on 16 permanent sample plots aggregating 80 acres on the Payette National Forest in central Idaho. Three plots were established on cut-over areas, while the others remained in the virgin condition during the 5 years of the study. The cut-over areas are in a much thriftier condition. In the virgin stands losses were caused principally by bark-beetle infestations, mistletoe infection of Douglas fir, wind-throw, and suppression. These causes of loss were largely eliminated from the cut-over stands. Porcupines were responsible for some injury. The rate of volume growth in relation to the volume of the stand was strikingly greater in the cut-over than in the virgin stands. In the latter the loss through death and decay practically offset the growth. The application of the results to silvicultural practice is discussed.—*Author.*

6253. Lachaussée. **Concours d'améliorations pastorales et forestières. [The improvement of pasture for grazing or by reforestation.]** Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de L'Est **15:** 420–424. 1924.—Considerable areas of communal lands in the Jura have become worthless for pasture or any other purpose.—*J. Kittredge, Jr.*

6254. Lamb, Frank H. **Perpetuating Pacific Northwest forests.** Timberman **26³:** 194, 196, 198, 200, 202. 1925.—The lumber industry, forest protection, and the possibilities of continuous production are discussed. A more intelligent, uniform, and stable method of assessing timber land for taxation purposes is considered preferable to a yield tax.—*Duncan Dunning.*

6255. Lesseux, C. de. **En marge d'un aménagement de sapinière en Alsace. [Working plan development in a fir forest in Alsace.]** Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est **15:** 406–412. 1924.—The management of the forest of Luttenbach from 1868 to 1923 is outlined, with statistics. The annual growth increased from 2.8 cu. m. per ha. in 1879, to 5.2 cu. m. in 1923. The present plan provides for classifying the stands in 3 groups: the 1st, containing ⅕ of the area, includes the oldest stands, which are to be regenerated in ⅕ of the rotation, regulating the cut by volume. The 2nd group, also ⅕ of the area, includes the stands which will be ready for re-generation during the 2nd period, and until then will be subject to improvement cuttings, thinnings, and cleanings, in 12-year cycles. The third group comprises the other ⅗ of the forest.—*J. Kittredge, Jr.*

6256. Levaković, A. [Rev. of: Orlov, M. M. **Ljesnaja taksacija. (Forest measurement.)** *viii + 420 p. 50 fig.* (Commissariat for agriculture): Nowaja Djerewnja Petrograd 1923.] Forstwiss. Centralbl. **47:** 153–158. 1925.—This is the 1st Russian work covering the whole field of forest measurement. The reviewer considers it the most thorough and

analytical treatment of the subject that has ever been published. Especial mention is made of Kosizyn's formulae for obtaining volumes of trees and stands, and of the author's discussion of universal yield tables.—*W. N. Sparhawk.*

6257. MacDougal, D. T. **Growth in trees, recorded by the dendrograph.** Carnegie Inst. Washington Year Book **23**: 125–126. 1924.

6258. Mason, David T. **Reforestation in western United States.** Timberman **26**[4]: 194, 196, 198. 1925.

6259. Mills, Mark C. **The wood industries in New York and its environs. Present trends and probable future developments.** *521 p. 5 fig.* Committee on Regional Plan of New York and its Environs: New York, 1924.

6260. Miura, Tejiro. **Untersuchungen zwecks rationeller Ausgestaltung von Bremsmitteln im modernen Riesbetrieb.** [Studies on the proper construction of braking devices on timber slides.] Forstwiss. Centralbl. **46**: 693–709, 741–756. *13 fig.* 1924.

6261. Møller, C. M. **Nye Retningslinier i Skovbruget.** [New lines in forestry.] Nat. Verden **8**: 359–409. *Fig. 1–6.* 1924.—Forests cover 8.4% of Denmark's area, mostly on soil not fit for agriculture, and produce annually 700,000 cu.m. of wood. Intensive silvicultural methods with dense planting are preferred, the 1st thinning coming after 20–25 years; the succeeding thinnings are rather intense and follow at short intervals. The State Forestry Research Service has conducted numerous investigations in order to determine the most favorable methods of thinning. In the working plans there is a tendency to distribute the age classes as uniformly as possible, and to regulate the cut on the basis of age-classes.—*Ernst Gram.*

6262. Oppermann, A. **Granskovens Sundhedstilstand paa Forsøgsvaesenets faste Prøveflader.** [Health conditions in spruce permanent sample plots.] Forst. Forsögsv. Danmark **6**: 23–86. *3 fig.* 1922.—The various pathogenes found are discussed, their effect is shown and their ecology explained. One of the most important of the fungi was *Polyporus radiciperda;* others include *Armillaria mellea, Nectria cucurbitula, Lophodermium abietis,* and *Trametes pini.* The regulation and control of disease by means of judicious thinning is shown to be possible.—*T. S. Hansen.*

6263. Oppermann, A. **Skovbrugets Forsøgsvæsen.** [The Danish forest research service.] Nat. Verden **8**: 471–476. *2 fig.* 1924.—The service dates from 1901 and was reorganized in 1917. It is headed by a director and a board under the supervision of the Dept. of Agric. There is a central laboratory in a forest near Copenhagen, and the experiments are scattered over the country. A nursery provides facilities for investigation of varieties, fertilization, etc., and provides stock for experimental field planting. A special series of reports is published, of which the contents from 1919–1924 is listed.—*Ernst Gram.*

6264. Oppermann, A. **Skovfyr i Midt. og Vestjylland.** [Scotch pine in central and west Jutland.] Forst. Forsögsv. Danmark **6**: 139–336. *52 fig.* 1922.—This is a complete discussion of the introduction of Scotch pine into Denmark, its growth in the past, the present stand, its economic importance, and its resistance and susceptibility to fungus attack.—*T. S. Hansen.*

6265. Oppermann, A. **Studier over Bogebraende.** [Studies of beech firewood.] Forst. Forsögsv. Danmark **6**: 1–22. *2 fig.* 1922.—The studies deal with the effect of different methods of piling wood of various shapes upon the relationship between actual cubical contents and stacked volume; the relation between the rate of seasoning and the fuel value; and that between moisture content and yield of charcoal.—*T. S. Hansen.*

6266. Parker, R. N., and B. L. Gupta. **New Indian species of forest importance. Part 5.** Indian Forest. **48**: 247–258. 1922.—The names of 157 species are included in this catalogue, with reference as to where they have been described.—*E. N. Munns.*

6267. Pasupati, E., and J. A. Pilgrim. **Analyses of the tanning properties of certain Burma Lagerstroemias.** Indian Forest Rec. **10**[5]: 58–85. 1924.—The results are given of investigations into the tanning properties of extracts made from leaves, wood, and bark of *Lagerstroemia villosa, L. tomentosa, L. macrocarpa,* and *L. Flos-Reginae.*—*E. N. Munns.*

6268. Peavy, Geo. W. **Oregon forests a renewable resource.** Timberman **26**[3]: 143–144. 1925.

6269. Perry, George S. **How to know the common trees and shrubs of Pennsylvania, native and introduced.** Pennsylvania Dept. Forests & Waters Bull. 33. *1–90.* 1924.

6270. Pilgrim, J. A. **A report on the tan values of Indian myrobalans and Burma Terminalias.** India Forest Bull. [Delhi] 56. *1 7.* 1923.—The results are given of investigations of the tannin content in fruits of *Terminalia Chebula, T. pallida,* and *T. citrina;* and in the leaves, bark, and wood of *T. belerica, T. bialata, T. tomentosa,* and *T. Oliveri.*—*E. N. Munns.*

6271. Pilgrim, J. A. **Burma oak and chestnut tans.** Indian Forest Rec. 10^{11}: 263–352. 1924.—The best species of native oaks and chestnuts for tannin extracts have been found to be *Castanopsis argyrophylla, C. tribuloides, Quercus fenestrata, Q. spicata-microcalyx,* and *Q. lindleyana.* Other species tested included *Q. Griffithii, Q. incana, Q. serrata, Q. brandisiana, Q. helferiana, Q. mespilifolia, Q. spicata-brevipetiolata, Q. truncata,* and *Castanopsis Clarkei.* —*E. N. Munns.*

6272. Pilgrim, J. A. **Tan investigation of the Burma hill pine, Pinus khasya, bark, and pyinkado, Xylia dolabriformis.** India Forest Bull. [Delhi] 57. *1–7.* 1923.—The outer scaley bark of the former species yields a large amount of tannin which makes good leather. The wood has no value for this purpose, but it should be possible to harvest the bark without injury to the tree. The bark and wood of pyinkado are of little commercial value as sources of tannin.—*E. N. Munns.*

6273. Pilgrim, J. A. **Tannin investigation of some Burmese Dipterocarps.** Indian Forest Rec. 10^{9}: 167–189. 1924.—Tests were made of *Hopea odorata, Pentacme suavis, Shorea obtusa, Dipterocarpus turbinatus* and *D. alatus,* all Indian species. Wood, bark, twigs, and leaves were used. Samples indicate that both wood and bark of the 1st-named species are exceedingly valuable for tanning purposes. The tannin from *P. suavis* is less in quantity and not as good as that from *H. odorata;* it could be used as a substitute for sumac tannin. *S. obtusa* has little value for tannin, and the last 2 species have practically no value. The degree of penetration and quality of leather produced by the different tannins are discussed.—*E. N. Munns.*

6274. Pilgrim, J. A. **The mangroves of South Tenasserim, Southern Burma.** Indian Forest Rec. 10^{10}: 191–263. 1924.—A brief description of the mangrove forests is followed by analyses of the tannin content and a discussion of the suitability of the species for tanning purposes. The species described are *Heritiera* spp., *Carapa obovata, C. moluccensis, Carapa* spp., *Rhizophora* spp., *R. mucronata, R. conjugata, Ceriops candolleana, Bruguiera gymnorhiza, B. corophylloides, B. parvifolia, Aegialites rotundifolia, Sonneratia Griffithii, Excoecaria agallocha,* and *Avicennia officinalis.*—*E. N. Munns.*

6275. Prell, Heinrich. **Forstchädliche Laufkäfer (I).** [Ground beetles injurious to forests.] Forstwiss. Centralbl. 47: 67–73. *4 fig.* 1925.—Beetles belonging to the genera *Amara, Harpalus, Pseudophonus, Poecilus, Calathus,* and *Bembidion,* and probably also *Omaseus,* although normally carnivorous, occasionally eat the tender roots of newly germinated tree-seedlings, especially in nursery beds.—*W. N. Sparhawk.*

6276. Rhl. **Die bayrische Anweisung über die Nutzbarmachung der staatlichen Jagden (Jagdnutzungsanweisung, J. N. A.) nebst Vollzugsvorschriften.** [Regulations for the exploitation of game in the Bavarian state forests.] Forstwiss. Centralbl. 47: 31–47. 1925.—The object of game management is to derive the largest net return consistent with the welfare of the forests and the farms in their vicinity, with due regard for the character and amount of available forage. In general, the State itself controls the hunting; in exceptional cases, hunting privileges may be leased.—*W. N. Sparhawk.*

6277. Richter. **Aufforstung der Windbruchfläche im Forstamte Glashütten.** [Reforestation of an area denuded by a tornado in the Glashütten forest.] Forstwiss. Centralbl. 47: 148–152. 1925.

6278. Rosegard, John. **Forest reproduction on the Pacific Coast.** Timberman 26^{4}: 190–192. 1925.—The results of observations in western Washington are given.—*Duncan Dunning.*

6279. Schaeffer, A. **Coupe de conversion.** [Conversion cuttings.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 416–420. 1924.—Conversion cuttings are defined as applicable to any stand of trees with distinct single boles, of which the regenera-

tion is expected only by natural seeding. The cuttings will be selective, but regular high forest will not result. As prescribed by Borel, the application of this system in coppice stands involves frequent cutting over the same area to remove mature or defective trees, thinning of over-stocked clumps of young growth, and releasing seedlings, meanwhile always leaving the crown canopy complete. By this method, the annual growth has been increased from 4–5 to 10–11 cu. m. per ha.—*J. Kittredge, Jr.*

6280. Schlich, William. **Schlich's manual of forestry. Vol. III. Forest management, including mensuration and valuation.** *5th ed. vii + 383 p. 67 fig.* Bradbury, Agnew & Co., Ltd.: London, 1925.—"This volume is chiefly destined for the use of students of forestry. . . . In 'Mensuration' several methods of the measurements of standing crops have been added. . . . Of 'Forest Valuation' the greater part has been rewritten, and the chapter on the financial results of forestry has been treated from a new point of view. . . . The Continental yield tables . . . have been replaced by British yield tables.—A great part of 'Management' has been rewritten on the basis of further experience gained since the publication of the 4th edition. Several new methods of treatment have been added, specially elaborated with the object of improving the process of regeneration and the preservation of the yield capacity of the soil."—*From author's introduction.*

6281. Schüpfer. [Rev. of: Schilling, L. **Betriebs- und Ertragsregelung im Hoch- und Niederwalde.** (Regulation of management and cut for high forest and coppice.) *4th ed. Illus.* J. Neumann: Neudamm (Prussia), 1924.] Forstwiss. Centralbl. 46: 728–730. 1924.

6282. Schwappach, [Adam]. **Geschichtliche Entwicklung der Staatsforstverwaltung in Preussen.** [History of the development of the State forest administration in Prussia.] Deutsch. Forstzeitg. 40: 99–101, 121–125, 195–198. 1925.

6283. Seaman, L. N. **Interim report on work under projects 1 and 0 by the section of timber testing, including the results of the mechanical and physical tests.** Indian Forest. Rec. 10^7: 145–151. 1924.—Tables indicate the static and impact bending, compression, hardness, shear and other properties, including the working stresses, of teak (*Tectona grandis*), sain (*Terminalia tomentosa*), deodar (*Cedrus deodara*), in (*Dipterocarpus tuberculatus*), kanyin (*D. alatus*), gurjan (*D. turbinatus*), chir (*Pinus longifolia*), sal (*Shorea robusta*), silver fir (*Abies Pindrow*), spruce (*Picea morinda*), jarrah (*Eucalyptus marginata*) and several others.—*E. N. Munns.*

6284. Šiman, Karel. **Forestry.** [In: Czechoslovakia. Edited by Josef Gruber. *xix + 256 p.*] *P. 33–42.* MacMillan Co.: New York, 1924.—The extent and character of Czechoslovakia's forest resources are described, with information on their economic importance and the forest policy of the State.—*W. N. Sparhawk.*

6285. Sullivan, W. H. **Growing trees for pulp and lumber.** Timberman 26^4: 51. *3 fig.* 1925.—The Great Southern Lumber Company commenced reforestation work in Louisiana in 1920, and now has 200,000 acres under protection. Of the 120,000 acres of cut-over land, 95,000 acres are reproducing naturally and the rest is being planted. About 3,000,000 *Pinus taeda* and 1,000,000 *P. caribaea* seedlings will be produced in the nursery this year. *P. palustris* is mostly seeded direct. Many miles of fire control lines have been constructed and 35,000 acres have been fenced against hogs.—*Duncan Dunning.*

6286. Vanselow. **Die erste Forsteinrichtung im Spessart (i. J. 1772).** [The first forest regulation in the Spessart forest, in 1772.] Forstwiss. Centralbl. 47: 81–97. *1 fig.* 1925.—Serious inroads on the forest resulted from cutting for firewood, charcoal, and potash, beginning in the 15th century, and led to the adoption of a definite plan for regulating the cut and maintaining a sustained yield. This plan, which was prepared by Forstmeister Dessloch after a careful survey and stock-taking of the entire forest, is an important milestone in the development of the science of forest regulation. Its provisions are described in some detail. Regulation was by area rather than by volume.—*W. N. Sparhawk.*

6287. Vaulot, G. **De quelques causes peu connues qui influent sur la végétation forestière.** [Some little known factors influencing forest growth.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 424–430. 1924.—One of the remarkable phenomena of forest growth is the relation which seems to exist between the different parts of the crowns. If a tree is crowded on 1 side, the other develops to compensate for the crowding;

if the lower branches are crowded off, the top develops so much the more rapidly. The upper sections of the standards in a forest of coppice-under-standards put on more wood as the coppice grows and crowds off the lower limbs. Figures show the variations in annual growth from 1874 to 1883 and in monthly growth of deciduous and coniferous trees for 1 year. A high correlation is found between the production of wood and of grain, the precipitation, and the evaporation by the plants.—*J. Kittredge, Jr.*

6288. Viellard, L. **L'article 2 de la loi du 26 mars 1924 concernant les mesures à prendre contre les incendies des forêts.** [The law concerning measures against forest fires.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 412–415. 1924.—A railroad company has the right, after notifying the proprieter of adjoining woodlands, to brush out a strip 20 m. wide on either side of the railway. This clearing does not include the forest trees. The owner may remove any of the products within a month, after which the railroad company must dispose of the balance.—*J. Kittredge, Jr.*

6289. Western Australia, Department of Education. **A primer of forestry, with illustrations of the principal forest trees of Western Australia.** Prepared under the supervision of C. E. Lane-Poole. *115 p. 46 fig. 1 map.* F. W. Simpson, Govt. Printer: Perth, 1921.

6290. Wind, R. **Bijdrage tot de Kennis van de plantaardige looimiddelen en het vraagstuk der looistofvoorziening van Nederlandsch-Indië.** [Vegetable tannins and the problem of tannin production in the Dutch East Indies.] Mededeel. Proefsta. Boschwez. 9: v + 301. *12 pl. 1 map.* 1924.—Following a discussion of the leather industry and the trade in leather and tanning materials in Dutch East Indies and the Straits Settlements, the author takes up in detail the principal local sources of vegetable tannin. These are mangroves (18 genera and 29 species), pilang (*Acacia leucophloea* Willd.), trenggoeli (*Cassia Fistula* L.) segawe (*Adenanthera microsperma* T. & B.), weroe (*Albizzia procera* Bth.), kemloko (*Phyllanthus emblica* L.), various *Quercus* and *Castanea* spp., and several species of minor importance. For each, information is given as to distribution, yields of bark, tannin content, use in tanning, and possibility of cultivation. Wattle culture is also treated. Considerable space is devoted to a detailed description of the inundated tidal forests in various localities.—*W. N. Sparhawk.*

6291. Wirt, George H. **Lessons in forest protection.** Pennsylvania Dept. Forests & Waters Bull. 35. *1–37.* 1924.—The purpose of the bulletin is to enlighten the citizens of Pennsylvania regarding the damage done by forest fires.—*W. N. Sparhawk.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 6050, 6056, 6069, 6085, 6100, 6171, 6173, 6190, 6333, 6341, 6342, 6343, 6371, 6377, 6439, 6508, 6515, 6536, 6540, 6544, 6594, 6597, 6715, 6728, 6743)

6292. Aebly, J. **Ueber die Möglichkeit einer chemischen Deutung der Bastardbildung und Mendelspaltung.** [The possibility of a chemical signification of hybridization and Mendelian segregation.] Vierteljahrsschr. Naturforsch. Ges. Zurich 69: 39–51. 1924.—The author maintains that Mendelian segregation on an $AA + 2Aa + aa$ basis, in its simplest form, has not been established as a general theory and proceeds to develop a chemical hypothesis of heredity, regarding hybridization and Mendelian segregation as reversible chemical processes. In the simplest case of a monohybrid, crossing AA and aa we get: (1) $A + a \rightarrow Aa$ (Hybridization), (2) $Aa \rightarrow A + a$ (Mendelian splitting). Combined we get: (3) $A + a \rightleftarrows Aa$.—*John H. Schaffner.*

6293. Blaringhem, L. **Études sur le polymorphisme floral. III. Variations de sexualité en rapport avec la multiplication des carpelles chez le Mercurialis annua L.** [Studies on floral polymorphism. III. Variations of sexuality in connection with multiplication of the carpels in Mercurialis annua L.] Bull. Soc. Bot. France 69: 84–89. 1922.—*Mercurialis annua* is a monoecious plant in which the separation of the sexes is not absolute. In autumn large num-

bers of ♀ stalks produce at the base of the floral axes, small, late ♂ flowers, which seldom open. Different lines differ in degree of such variation, but in observations extending over a period of years the author was unable to find any groups of plants of which the majority were monecious throughout the flowering season. In August, ♂ plants and plants strictly ♀ were in the majority, but in autumn after the ♂ plants had dried up the frequency of sessile ♂ flowers at the base of the ♀ flowers increased. A positive correlation exists between senility with its lower vigor and the production of ♂ flowers on ♀ plants. There also appears to be a positive correlation between hermaphrodite flowers and an increased number of carpels. The period when multiple carpels and bisexual flowers are produced comes as a transition stage between the pure ♀ flowers in the early life of the plant and the senile period when accessory ♂ flowers are produced.—*V. H. Florell.*

6294. Brôzek, A. **Selektions- und Kreuzungs-experimente mit albomakulaten (weissbunten) Mimulus-rassen.** [Selection and hybridization experiments with albomaculata (green and white striped) Mimulus races.] Studies Plant Physiol. Lab. Charles Univ. Prague. **1**: 45–79. 1923.—The author gives in detail the results of selections and crosses in variegated Mimulus races showing in figures and plates the types of green and white striping obtained and in a table the genetic continuity of a pure line and its crosses from 1912 to 1922. The results of his work he summarizes as follows: The green and white striping is due to the presence and abnormal distribution of 2 morphologically and genotypically different cell tissues in the same plant. It is transmitted exclusively through the mother plant and has in all probability its source in a mutation originating in the plasma of the plastids and is in no way connected with the transmission of factors through the nucleus. It was observed just as much in pure *Mimulus rubinus* and *M. speciosus* lines as in the different crosses in F_1 and F_2. Since the vegetative segregation leads only to "pure white" or "pure green' protoplasts it seems most probable that the predominating number of egg-cell plasma plastids—as compared with the much smaller number of plastids which during fertilization are carried in by the pollen tube plasma—determines the amount of variegation in the progeny.—*Charlotte Eliott.*

6295. Cummings, M. B., and E. W. Jenkins. **Sterility of strawberries; strawberry breeding.** Vermont Agric. Exp. Sta. Bull. 232. 1–61. 1923.—This bulletin stresses the study of the inheritance of sexual defects. A long series of experiments with diverse soil types and variable amounts of commercial fertilizers, etc., failed to modify the sexual condition of the plants. By breeding perfect with imperfect varieties it was possible in some cases to introduce the missing sex into an imperfect variety without materially changing its other characteristics.—*George P. Burns.*

6296. Dahlgren, K. V. Ossian. **Om Lysimachia Nummularia i Sverge.** [Lysimachia Nummularia in Sweden.] Bot. Notiser **1922**: 129–148. *Map.* 1922.—The author enumerates 17 species in the Swedish flora which seldom set fruit, among these *Lysimachia Nummularia*, which is evidently self-sterile. As the plant readily propagates vegetatively, most colonies have arisen from a single plant. Therefore the author introduced specimens from widely separated localities and in 1918 and 1919 made about 800 pollinations. A few self-pollinations were made, all proving failures. On the contrary, the cross-fertilizations were mostly successful and good fruit were formed. Spontaneous formation of good fruit has been recorded from but 1 locality in Sweden, Helgerum, Vestrum Parish, Småland, in 1858. The plant is a native of Europe and introduced in America. In Sweden it is found in the southern half, perhaps originally an escape except in the province of Skåne. The map gives only 6 localities north of Upsala. There is given a list of localities in Sweden, comprising 7½ pages, and a list of 63 literature references.—*P. A. Rydberg.*

6297. Davenport, C. B. **Detailed report on current investigations [in the Department of Genetics of the Carnegie Institution of Washington.]** Carnegie Inst. Washington Year Book **23**: 24–52. 1924.—This summary covers the work of the Department of Genetics for the period, November 1923 to June 1924.—*B. E. Livingston.*

6298. Fuchs, A., and H. Ziegenspeck. **IV. Chromosomen einiger Orchideen.** [Some orchid chromosomes.] From: **Monographie des Orchis Traunsteineri.** Mez, Bot. Archiv **5**: 457–470. *1 pl., 3 fig.* 1924.—Vegetative division in the orchids shows the remarkable fact that splitting of the chromosomes gradually becomes complete in the plate. This observation

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stands in contrast to the usually observed simultaneous splitting of the chromosomes. This successive splitting is also found in reduction division. In pure species the successive splitting is complete when the homotypic division is complete. We have here a uniform distribution of the chromosomes in the sexual generation. In some hybrids the homotypic division remains suppressed. In others there follows an uneven distribution of split and not split chromosomes in the heterotypic division, which may mean an increase or decrease in number of chromosomes when splitting takes place in the homotypic division of the sexual cells. This explains the occurrence of forms with increased or decreased chromosome number. Gigas-, semigigas- and infra-forms are, therefore, of hybrid origin.—*Carl Mez (transl. by William Seifriz).*

6299. Gowen, John W. **Interpretation of dairy pedigrees.** Maine Agric. Exp. Sta. Bull. 318. *53–80. Fig. 9–12.* 1924.—It is shown that the ancestors on which the greatest dependence may be placed in estimating the productive worth of a dairy animal from its pedigree are the dam, full sisters, half sisters and grandparents, as judged by their recorded performances. There appears to be no influence of inbreeding, relationship, or of famous ancestors on the production of the progeny of dairy sires. Efforts of breeders of purebred stock have tended to make such animals pure for certain types of production (for example, milk yields and butterfat percentages) which are passed on to their offspring more frequently than by animals having an unknown ancestry.—*H. C. McPhee.*

6300. Грюнберг, О. [O. Grünberg] **Дополнение к радошедра Манойлова Определение пола у двудомных растений при помощи химической реакции.** [An addition to the paper of Dr. Manoilov: "Identification of the sexes in dioecious plants by chemical reactions."] Труды по прикладной Ботанике и селекции. [Bull. Appl. Bot. and Plantbreed.] **13**²: 506. 1922–1923 [1924.]—The author—following Manoilov's reaction experiments (See this issue, Entry 6305.)—obtained positive results from the following plants: *Vallisneria* sp?, *Urtica dioica, Cannabis sativa, Populus* sp., *Hippophae rhamnoides, Encephalartos villosus, E. longifolius* and *Begonia* sp. Especially interesting results were obtained with *Begonia*, ♂ flowers giving a characteristic ♂ reaction ♀ flowers giving a ♀ reaction and leaves giving an intermediate one.—*M. Demerec.*

6301. Huntington, Ellsworth. **The character of races.** *xvi + 393 p. 19 fig.* Charles Scribner's Sons: New York, 1924.—This is a study of the effect of environment and natural selection on the formation and character of races. In the 1st chapter, the various concepts of race are discussed and in a strict sense, "races should be defined only in terms of heredity. But certain geographical factors, such as climate, food, occupations, have a distinct effect in changing racial characteristics," for example, production of certain habits and selection of certain types for preservation and others for elimination. Inherent racial differences are due to 3 chief causes: mutations, racial mixtures, and natural selection. The chapter subjects are: Racial character and natural selection; first steps in human character; the earliest great migrations; glaciation and the supremacy of Europe; the suppression of America; the classification of races; the anomalies of aboriginal America; the Asiatics who dwell in tents; Jews, Armenians, and Turks; cycles of Chinese history; north versus south in China; the scourge of family; the selection of the Chinese; the 3 great races of Europe; the character of modern Europe; the contrast between Greeks and Irish; the dispersal of the Northmen; warlike Normans and peaceful Icelanders; the persistence of a selected inheritance; the direct effect of environment on character; the selection of modern Americans; the racial test of cities; democracy and feminism.—A list of references is appended.—*Orland E. White.*

6302. Карпеченко, Г. Д. [Karpechenko, G. D.] **Число хромозом и генетические взаимоотношения у культурных Cruciferae.** [The number of chromosomes and the genetic correlation of cultivated Cruciferae.] (English summary.) Труди по прикладной Ботанике и селекции. [Bull. Appl. Bot. and Plantbreed.] **13**²: 3–14. *2 pl.* 1922–1923 [1924].—Cytological investigations on different cultivated species of Cruciferae reveal the existence of the following diploid number of chromosomes: *Brassica Napus* L. and *B. juncea* Czern. have 36 chromosomes; all varieties of *B. Rapa* L.—including var. *campestris* L., *B. chinensis* L., and *Brassica* "cultivated in Pamyrs-variety" which is difficult to determine—have 20 chromosomes; all varieties of *B. oleracea* L. and *B. "Schnittkohl"* have 18 chromosomes; *B. nigra* Koch. has 16 chromosomes; *Sinapsis arvensis* L., 18; *S. alba* L. and *S. dissecta* Lag., 24; *Raphanus raphanis-*

trum L. and *R. sativus* L., 18 chromosomes. The cytological analysis supports the latest statements of systematists that *B. chinensis* L. and *Brassica* "cultivated in Pamyrs" are varieties of *B. Rapa*; B. "Schnittkohl" belongs to *B. oleracea* L.; *S. dissecta* Lag. is a subspecies of *Sinapsis alba* L.; *R. raphanistrum* L. is closely related to *R. sativus* L. Within the limits of separate genera, plants having the same number of chromosomes are easily crossed, while the crossing of plants with a different number of chromosomes is difficult.—*M. Demerec.*

6303. Kondo, Mantarô, and Yasukitu Noguti. [Correlation between the quantitative characteristics of selected elite plants oï rice, wheat and barley and between the same characteristics of their offspring.] (Japanese.) Jour. Sci. Agric. Soc. 242: 947–962. 1922.—The authors have investigated this question in rice, wheat and barley. First they selected several "elite" plants with different characteristics, which had been grown in the field under as similar conditions as possible. The next year each "elite" had multiplied to 150 or 200 offspring apiece. Investigations in the "elite" plants involved total plant weight, straw weight, number of stacks, stalk length, total grain weight, number of grains per panicle, percentage of grain weight in total plant weight, (percentage of glume weight in grain weight of rice, weight of 1000 grains, and closeness of grain on the ear. In the offspring the above mentioned characteristics were investigated again. Then the authors calculated the correlation coefficients of these quantitative characters between the "elites" and their offspring. These field experiments lasted from 1914 to 1917. Eight varieties of rice, 3 of wheat and 3 of barley were used. The results are as follows: (1) Positive correlation exists between the grain and its offspring in the following characteristics—grain number on an ear or panicle, closeness of grain on the ear, thousand grain weight, and stalk length. (2) No definite correlation whatever was found as regards the following characteristics: Number of stalks, total plant weight, total grain weight, straw weight, percentage of grain weight in total plant weight, and percentage of glume weight in grain weight of rice. (3) In the selection of "elites" it is desirable to consider the characteristics of the ear or panicle and quality of the grain. Stalk number and total grain weight are not so important. In addition, the authors investigated the correlation between 12 different characters of "elite" plants of rice and the grain production of the offspring, with negative results.—*Authors (translated).* (*Courtesy Japanese Jour. Bot.*)

6304. Krüger, W. Die Sorten- und Züchtungsfrage im Flachsbau mit variationsstatishschen Untersuchungen von Zuchtsstämmen und Sorten. [Varietal and breeding problems in flax culture, with statistical investigations of pedigreed races and varieties.] Mez, Bot. Archiv. 10: 33–81. 1925.—The 1st part of the paper discusses investigations relative to the derivation of flax and its agricultural varieties, and includes taxonomic viewpoints, white-flowered flax, the origin of the blue-flowered flaxes, and the splitting up of varieties.—With respect to the last mentioned phase of the subject, the author notes that for seed-production, an involuntary selection is made of the most highly branched plants, on account of their higher yield of seed, but among which there are individuals unsuitable for fiber production.—The 2nd part deals with the aims and methods of flax breeding, details of technique, and pedigreed varieties.—Finally, the author presents the results of a statistical study of variation in a breeding experiment with *Linum usitatissimum.* *Carl Mez (transl. by F. V. Rand).*

6305. Манойлов, Е. О. [Manoilov, E. O.] **Определение пола у двюдомных растений при помолщи химической реакции.** [Identification of the sexes in dioecious plants by chemical reaction.] (With German summary.) Труды по прекладной Ботанике и селекции. [Bull. Appl. Bot and Plantbreed.] 13²: 503–505. 1922–1923. [1924].—The author found a reaction by which it is possible to distinguish ♀ blood from the ♂. Since it has been shown that haemoglobin is chemically related to chlorophyll the author tried to see if the same reaction would occur in dioecious plants. Experiments made with *Acer Negundo, Lynchnis dioica, Vallisneria, Urtica* and *Cannabis*, gave results which agreed with his expectations. The method used is as follows: to 3 cc. of alcoholic (60%) extract of chlorophyll, 10 drops of 1% solution of papayotin in water were added and left for 1–2 minutes; then 3 drops of 1% alcoholic solution of Dahlia or Grüblers Methyl-green, 10 drops of 1% solution of potassium permanganate, 1–3 drops of 40% hydrochloric acid and 5 drops of 2% thiosinamin were added. After the addition of the 1st, 2nd and 3rd reagents the material must be stirred, and after the addi-

tion of the 4th and 5th reagents, it must be shaken. Solutions made from the ♂ plants soon became colorless, and those from the ♀ plants retained their color. (See this issue, entry 6300.)—*M. Demerec.*

6306. Miyazawa, Bungo. [Genetic studies on the seed-color of Japanese convolvulus.] (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 2: 1–11. 1923.—Cross I (fl. = color of flower, s.c. = color of seed coat) white fl., white s.c. (A) × blue fl., brown s.c. (B). F_1 = A × B with light blue fl., black s.c.; F_2 = 9 blue fl.; black s.c.: 3 blue fl., brown s.c.: 4 white fl., white s.c. Interpretation: Variety A = *RRccnnKK*, variety B = *RRCCNNkk*. *R* + *C* for flower color, inactive singly; *K* + *N* for black seed coat, *K* inactive alone, *N* alone for brown seed coat; *C* & *N* absolutely linked. F_3 grown.—Cross II: Blue fl., brown s.c. (B) × white (rather yellowish, tube slightly reddish) fl., black s.c. (C). F_1 = B × C with blue fl., black s.c. F_2 = 9 blue fl., black s.c.: 3 blue fl., brown s.c.: 3 white fl., black s.c.: 1 white fl., brown s.c.—Interpretation: Variety B = $R_1R_1R_2R_2CCNNkk$, variety C = $R_1R_1r_2r_2CCNNKK$—*C*, *N*, *K* as in Cross I. R_1 + C produces the blue color of the flower tubes. R_2 + C the same in all other parts. F_3 grown.—Cross III: white fl., white s.c. (A) × scarlet fl., black s.c. (D). F_1 = (A × D and D × A), blue fl., black s.c. F_2 = 3 blue fl., black s.c.: 1 white fl. and s.c.—Interpretation: Variety A = *RRccnnKK*, variety D = *RRCCNNKK*.—Cross IV: white fl., white s.c. (A) × white, rather yellowish fl., black s.c. (E). F_1 = (E × A) blue fl., black s.c. F_2 = 9 blue fl., black s.c.: 3 white fl., black s.c. : 4 white fl., white s.c. Interpretation: Variety A = *RRccnnKK*, variety E = *rrCCNNKK*. F_3 grown. In one case the author has observed crossing-over between *C* and *N*, which otherwise appeared to be absolutely linked.—Cross V: The plants with black striped seed coats always have variegated leaves. Crossed with normal plants, the F_1 generation have green leaves: in F_2 they are green and variegated and the latter always have striped seed. Further, the author has made observations that colored seed coats have short soft hairs, while white ones are almost hairless.—*Author (translated.)* (*Courtesy Japanese Jour. Bot.*)

6307. Синская, Е. Н. [Sinskaia, E. N.] **К познанию закономерностей в изменчивости сем. Cruciferae.** [A contribution to the knowledge of regularity (parallelism) in the variability of the family Cruciferae.] Труды по прикладной Ботанике и селекции. [Bull. Appl. Bot. and Plantbreed.] 13²: 15–89. 1922–1923. [1924].—The parallelism of variability, for example, the occurrence of similar characters in different species, genera, and families is pointed out by Vavilov (Jour. Gen. 12: 47–89. 1922) and was worked out by the author for the family Cruciferae. Numerous characters occurring in different species are noted and several lists arranged according to the species and the characters are given. This study is based on different monographs and descriptions of the family Cruciferae.—*M. Demerec.*

6308. Синская, Е. Н. (Sinskaia, E. N.] **К тератологии Brassica campestris L.** [A contribution to the teratology of Brassica campestris L.] (With English summary.) Труды по прикладной Ботанике и селекции. [Bull. Appl. Bot. and Plantbreed.] 13²: 269–276. *1 pl.* 1922–1923. [1924].—In a family of *Brassica campestris*, grown for breeding purposes, 2 peculiar plants were observed, one of them had a special character of branching, denser leaves, was apetalous, had some of the stamens transformed into petals and some into carpels, while the other plant in addition to all these characteristics, showed the presence of bracts and proliferation of the inflorescence.—*M. Demerec.*

6309. Söhrens, J. **Geschlechts- u. Bestäubungsverhältnisse einiger Arten der Gattung Cereus.** [Sex and pollen relations in species of the genus Cereus.] Zeitschr. Sukkulent. 1924: 151–155. 1924.—Working with plants of *Cereus jamacaru*, the author found that selfing was unsuccessful but that cross pollination produced good fruit and viable seed. Reciprocal crossing with a native, night-blooming species, *Cereus coerulescens*, was also successful. Crossed with *Echinopsis Eyriesii* the fruit began to develop but dropped before maturing. Of the native cactus flora of Chile, only *Cereus chilensis*, *C. Funkii* and *C. nigripilis* have their flowers open day and night. All others are day-flowering. The moth, *Sphinx cestri*, and 2 species of bees, *Apis mellifera* var. *ligustica*, introduced into Chile and the smaller native *Colletes chilensis*, bring about cross pollination. Since most of the Chilean cacti bloom by day, the small Chilean bee is of first importance in cross fertilization.—*Charlotte Elliott.*

6310. Stoddard, Lothrop. **Racial realities in Europe.** *252 p.* Charles Scribner's

Sons: New York. 1924.—This work discusses Europe from the racial as contrasted with the "nationality" standpoint. The racial components of each European nation are examined and described from many angles, including the cause and effect relation between the racial composition of a nation and the character of its policies. The contents are grouped under 10 headings: Racial realities in Europe; kindred Britain; the Nordic north; composite France; the Mediterranean South; Alpinized Germany; disrupted Central Europe; the Alpine East; the Balkan flux; the new realism of science.—Three maps illustrate the present distribution of European races, the physical characteristics of Europe and the distribution of languages in Europe.—*Orland E. White.*

6311. Takahasi, Noboru. [**Linkage in rice.**] (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 3: 23–30. 1923.—The observations described in this article were made, in the 1st place, from plants produced by natural crossing. The characteristics concerned are common versus gluten endosperm, and the color of the awn or glume tip, whether it is red, first pale yellow then red, or white. The endosperm characters segregate as usual in a 3:1 ratio (that is, 3 common: 1 gluten). The color characteristics of the awn or glume tips give a 9 red: 3 yellow-red: 4 white ratio. In the author's opinion red = *CCRR*, white = *ccRR*, F_1 = *CcRr*, and yellow-red = *CCrr* or *Ccrr*. If one takes into consideration these endosperm and color characters in the F_2, one sees that the theoretically expected ratio deviates considerably from that obtained. This has led the author to the assumption of the coupling between the factors *C* (for color) and *U* (for usual endosperm type) and if the amount of gene interchange is estimated at approximately 21%, then there is perfect agreement between fact and theory.—*Author (translated).* (*Courtesy Japanese Jour. Bot.*)

6312. Takezaki, Yosinori. [**The inheritance of leaf color in purple rice plants. II.**] (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 2: 95–101. 1923.—The author had previously made the statement (see Japanese Jour. Bot. 1: 14. 1922) that in the purple rice plants which he investigated, purpleness is ascribed to the co-action of the 3 factors *A*, *B* and *C*, and that the lack of any one of these must lead to the production of green plants. It is, therefore, to be expected that, in the F_2 and following generations of the cross *AABBCC* (purple) × *aabbcc* (green), green plants lacking in one of the 3 factors would be obtained. According to this hypothesis, a cross between green individuals of different make-up obtained thus, must lead to the synthetic production of purple plants. However *A*, *B*, and *C* were united in 1 and the same zygote, as established by the facts from a number of such crosses. Detailed tabular results are given.—*Author (translated).* (*Courtesy Japanese Jour. Bot.*)

6313. Terasawa, Yasufusa. [**The heredity of Funkia ovata.**] (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 2: 13–21. *1 pl.* 1923.—Among the wild-growing individuals of *Funkia ovata* there are 2 varieties differing in leaf-size. They are entirely green and when selfed produce only their own kind. One large-leaved variety (Type I) with more or less large, white, ribbon-like patches in the leaf center, is quite sterile when selfed. Reciprocal crosses between this striped-leaved variety and the wild, large, green-leaved one produce seed.—In another type, either large or small-leaved, the leaves are only marginally striped with white (Type II) and self-fertilization as well as crossing with green plants almost always produces green offspring only. In a small-leaved variety where the white patches appear sideways on the leaves (Type III) self-fertilization produces a number of albinos, besides green offspring; crossing this variety with green plants, both green and albino offspring are in some cases obtained, while in other instances only greens are secured. In the author's opinion all the above named striped varieties are chimeras. In Type III the subepidermal layer is composed of green and white cells (sectorial chimera). Type II is a periclinal chimera where all the cells of the subepidermal layer are green, while Type I is a periclinal chimera similar to II, which is quite sterile because of lethal action.—*Author (translated).* (*Courtesy Japanese Jour. Bot.*)

6314. Vandendries, R. **Recherches expérimentales sur la bipolarité sexuelle des Basidomycétes.** [**Experimental investigations on the sexual bipolarity of Basidomycetes.**] Bull. Soc. Roy. Bot. Belgique 57: 75–78. 1924.—The author concludes after lengthy investigations that *Coprinus radians* is a heterothallic species, this heterothallism resulting from the spores of the 2 opposite sexes on the same carpophore; di- or polyhybrids do not exist. The 2 sexes of 1 carpophore differ from the 2 sexes of the neighboring carpophore. Sexual mutations

are very rare. A mutation can make a haplont fertile for all its congeners, sterile for certain haplonts of another carpophore. Thus, an exception arises to the established rule that fertility is certain between haplonts of different carpophores.—*É. De Wildeman (translated).*

6315. Waterhouse, G. A. **Presidential address, including account of breeding experiments with the Satyrine genus Tisiphone.** Proc. Linn. Soc. New South Wales 48: i-xxiii. *2 col. pl.* 1923.—The latter part of the paper is devoted to a discussion of the President's researches on further experiments in breeding with the Satyrine genus *Tisiphone*. *T. abeona* called *joanna*, a natural hybrid, and *T. morrisi* are discussed and illustrated in colors. The work gives further evidence that *Y. joanna* is a hybrid race. Notes are also given on the life histories of the Australian butterflies including members of Nymphalidae, Lycaenidae, Pieridae, Papilioidae, and Hesperidae. A list of food plants for these is being prepared.—*Eloise Gerry.*

6316. Winge, Ø. **Eksperimentelle Undersøgelser over Tandkarpen Lebistes. Ensidig og kønsbunden Nedarvning samt Overkrydsning mellem x- og y-Kromosomer.** [Experimental investigations on Lebistes. Unilateral and sex-linked heredity with crossing-over of x- and y-chromosomes.] Nordisk Jordbrugsforskning 1923: 524. 1923.

6317. Wriedt, C. **Arvefaktorer hos de hvide hester i Frederiksborg stutteri.** [Inheritance factors in white horses of the Frederiksborg stud.] Nordisk Jordbrugsforskning 1924: 173–183. 1924.—In the white horses of Frederiksborg 1 factor for white was present. Homozygotic white varies from white-over-white with grey specks to grayish-white, but the genetics of this variation is not determined. A lethal factor was present, probably linked to white.—*Ernst Gram.*

6318. Зайцев, Г. С. [Zaitzev, G. S.] **Цветение плодообразование и раскрытие коробочек у хлопчатика.** [Flowering, fruit-formation and dehiscence of the bolls of the cotton-plant.] (With English summary.) Труды по прикладной Ботанике и селекции. [Bull. Appl. Bot. and Plantbreed.] 13²: 391–460. 1922–1923 (1924).—This paper details the observations made on flowering, fruit-formation and dehiscence of the cotton-plant. Since the vegetative period of cotton is very short in Turkestan where the experiments were made, it is of primary importance to breed the varieties which ripen early. The author found that a direct correlation exists between the period of sowing to flowering and the period of sowing to maturity, the coefficient of correlation being + 0.875. The appearance of the buds and the opening of the flowers proceed in a definite order. Flowering begins with the 1st flower of the 1st sympodium, and successively, at intervals of 2–3 days, the 1st flowers on the 2nd, 3rd, etc., sympodia begin to open. The 2nd flower of the 1st sympodium opens 5–7 days after the 1st flower does, the 3rd opens after an equal interval, and so on. The appearance of successive flowers on other sympodia follows the same order as described for the appearance of 1st flowers. The author develops formulae by which it is possible to calculate the number of flowers present at any given time on a plant. An experiment showed that 10 hours after pollination ½ of the pollen-tubes had had the time to pass through the whole length of the style (17 mm). The shading of the flower affects the development of the fruit in that it reduces the number of seed formed, reduces the weight of the seed, and also the length of fibers.—The shedding of bolls is increasing in the direction from bottom to top, and still more from the center laterally. Artificial self-pollination in general reduces the rate of shedding by 20%, and also increases the number of seed formed in the fruit.—It was found that under Turkestan conditions, natural crossing approximates 5%.—For all the varieties of cotton, differing in early maturity, there exists a definite relation between the periods, sowing to flowering, and that of flowering to dehiscence of bolls. Under Turkestan conditions, the relation is 40x : 60x, where x is a variable characteristic for each variety.—*M. Demerec.*

HORTICULTURE

F. C. Bradford, *Editor*

(See also in this issue Entries 6036, 6072, 6085, 6138, 6377, 6401, 6556, 6583, 6600, 6640, 6650, 6680, 6685, 6715, 6742)

6319. Anonymous. **Census of fruit planted in N. S. W.** Agric. Gaz. New South Wales **36**: 107–112. 1925.—A complete census of all fruits according to varieties is presented, showing bearing plants and those not yet fruiting.—*L. R. Waldron.*

6320. Anonymous. **Further experiments in the storage of lemons.** Agric. Gaz. New South Wales **36**: 52. 1925.—Treating lemons with a casein and lime paste was found to be more expensive and gave less satisfactory results than treatment with vaseline.—*L. R. Waldron.*

6321. Anonymous. **Green manures.** Gen. Exp. Sta. A. V. R. O. S. Leaflet 18. *1–6.* 1923.

6322. Anonymous. **Selecting Hevea mother trees.** Gen. Exp. Sta. A. V. R. O. S. Leaflet 22. *1–3.* 1923.

6323. Anonymous. **The collection, despatch and laying out of selected Hevea seeds.** Gen. Exp. Sta. A. V. R. O. S. Leaflet 24. *1–3.* 1924.

6324. Anonymous. **The time for budding.** Gen. Exp. Sta. A. V. R. O. S. Leaflet 19. *1.* 1923.

6325. Armbrecht. **Pfitzers halbgefüllten Riesendahlien.** [Pfitzers semi-double giant dahlias.] Möllers Deutsch. Gärtnerzeitg. 39: 294-295. 1924.—Wilhelm Pfitzer is the originator of the semi-double giant Dahlias. They first drew attention in 1904. A number of varieties of this group are mentioned.—*J. C. Th. Uphof.*

6326. Austin, Lloyd. **Pruning bearing cherries and quinces.** California Cultivator **64**: 166. 1925.—This is a concise statement of the most approved methods of pruning these 2 fruit trees in California.—*C. S. Pomeroy.*

6327. Austin, Lloyd. **Pruning bearing plums and prunes.** California Cultivator **64**: 131. *2 fig.* 1925.—This is a statement of the most desirable methods of pruning these fruits in California. A warning is given against the severe heading back of healthy plums that is sometimes practised annually, and against the occasional severe cutting of prune trees that has been a common practice.—*C. S. Pomeroy.*

6328. Beach, John B. **Shade trees for Florida.** Florida Grower **30**[25]: 6–22. 1924.—*Ficus elastica* can be easily transplanted and is a very rapid grower. *F. altissima* is entirely immune from attacks of insects. *Eucalyptus robusta* is valuable as a shade tree. *Pithecolobium dulce* is a very promising tree and is popular along the lower East Coast. *Terminalia catappa* and *Bucida buchus* are rapid growing symmetrical shade trees. *Casuarina equisetifolia* does not stand much cold but will endure salt spray and salt winds close to the ocean.—*J. C. Th. Uphof.*

6329. Berger, V. **Dahlien-Neuheit "Frau Garteninspektor Berger."** [The dahlia novelty "Frau Garteninspektor Berger."] Möllers Deutsch. Gärtnerzeitg. **40**: 14. 1925.—Dahlia Frau Garteninspektor Berger is a hybrid between Schützenliesel and Demokrat. The color is between the red of Schützenliesel and the nankeen-yellow of the Demokrat.—*J. C. Th. Uphof.*

6330. Beverley, Gerald W. **The training and pruning of the sultana vine.** Agric. Gaz. New South Wales **36**: 135–143. *8 fig.* 1925.

6331. Børgesen, F. **Den sidste Vinters Indflydelse paa en Del, navnlig i de senere Aar, indførte stedsegrønne Træer og Buske.** [Influence of the winter 1923–1924 on some introduced evergreens, particularly in later years.] Gart. Tidende **40**: 393–396, 403–407. 1924.—An extended list of garden trees and shrubs, with annotations on the effect of a severe winter which has made it possible to list those considered hardy.—*Ernst Gram.*

6332. Church, C. G. A. **A comparison of the composition of standard varieties of avocados grown in the same orchard.** Florida Grower **31**[1]: 13–14. 1925.—Healthy trees of the varieties

Fuerta, Sharpless, Spinks, and Dickinson were used. The physical analysis consisted in estimations of specific gravity before and after storage, weight of whole fruit, and percentage of pulp, skin, and seed. The pulp was prepared for chemical analysis by passing it 3 times through a fine cutting foot grinder. The constituents determined were moisture, protein, fat and total sugar. Very little change is seen in the specific gravity of Fuerta from month to month, though a slight downward tendency is noted. In 5 out of 6 samples the specific gravity is greater after storage than before, the only one to decrease being the January sample. The average weight increases as the fruit matures. The fruit apparently reached its maximum development in May when percentages of pulp and skin decrease slightly and the percentage of seed increases. In similar ways examinations were made with other varieties. —*J. C. Th. Uphof.*

6333. Cummings, M. B., and W. C. Stone. **Yield and quality in Hubbard squash.** Vermont Agric. Exp. Sta. Bull. 222. *1-48.* 1921.—The Hubbard squash forms an important food material in New England and the bulletin is a study of the effects of self-, cross-, inter- and open-pollination upon yield and quality. The results show the possibility of greatly improving the squash by seed-selection. Under the term, quality, the authors include the chemical composition and especially the content of the sugars and starches which give flavor and food value, and to a considerable extent the structure of the flesh and the moisture content.—*George P. Burns.*

6334. Eaton, B. J. **Papain.** Malayan Agric. Jour. 12: 134–139. 1924.—This paper presents information concerning the cultivation of *Carica papaya* and the preparation of crude papain.—*R. B. Holttum.*

6335. Eaton, B. J., and J. H. Dennett. **Further report on the nipah palm.** Malayan Agric. Jour. 12: 154–162. 1924.—The first paper on this subject is contained in Vol. 11 of the same journal (see Bot. Absts. 12, Entry 5728). It is here reported that a palm may be tapped continually for 12 months and continue to yield an average of ¼ gallon of juice per day. Yields can be increased by keeping a permanent water supply around the roots of the palms. The sugar content of the juice is variable, the average yield being considered as 5–6 ounces per day. Experiments show that sulphuric acid can be used to arrest fermentation; this could be used to preserve juice intended for alcohol manufacture, but is useless if sugar is to be extracted, as it causes hydrolysis. No substitute for lime has been found as a preservative of juice intended for sugar manufacture.—*R. E. Holttum.*

6336. Ernst, Hermann. **Die Gruppen-Dahlia "Freibeuter" und "Brennende Liebe."** [The group-dahlia "Freibeuter" and "Brennende Liebe."] Möllers Deutsch. Gärtnerzeitg. 39: 287. 1924.

6337. Esbjerg, N. **Offentlige Foranstaltninger til Havebrugets Fremme i de tre nordiske Lande.** [Public promotion of horticulture in Denmark, Norway, and Sweden.] Haven 23: 161–162. 1923.—The horticultural area of Norway approximates 20,000 ha., of Sweden 50,000, and of Denmark 56,000 ha. Norway possessed in 1917 about 2 million fruit trees; Denmark, about 8 million. In horticultural teaching Norway is leading, with a horticultural college department, 4 state and 5 private schools, and 18 agricultural schools with special horticultural teachers. Sweden has no horticultural college, but 4 schools more or less connected with the state, and several short courses. Denmark has a horticultural college department (although smaller than the Norwegian) and 4 private schools, and provides for teaching of horticulture at household- and smallholders-schools. In advisory work Norway is very progressive, with 1 state advisor, 27 province gardeners, and 90 county gardeners. Sweden has some 50 advisors to the agricultural associations, Denmark has 2 state advisors and about 10 advisors to corporations. Experimental work is done in Norway at 5 stations with an annual allowance of about 54,000 Swedish crowns; in Sweden the experimental work is scant (20,000 crowns annually); in Denmark 3 state experiment stations (60,000 Swedish crowns) and some corporations conduct horticultural research.—*Ernst Gram.*

6338. Esbjerg, N. **Offentlige Foranstaltninger til Havebrugets Fremme i Danmark.** [Public promotion of horticulture in Denmark.] Haven 24: 1–7. *5 fig.* 1924.—This is a historical account of the horticultural work to date. In 1915 the state took charge of the station experimental work, from which 9 reports have appeared, in Tidsskr. Planteavl and

as separate bulletins. Horticultural and agricultural associations do experimental work supported by the state. The paper lists the present problems of research and the teaching facilities in different kinds of schools and courses.—*Ernst Gram.*

6339. Furtado, C. X. A study of the coconut flower and its relation to fruit production. Gard. Bull. Straits Settlements 3: 261–274. 1924.—A description of the flower is given, with a summary of present knowledge regarding pollination. Confirmation is given of observations that in the Malay Peninsula the female flowers in an inflorescence usually open before or at the time of the male, so that self-pollination is the rule there instead of being an occasional chance occurrence. Experiments on the vitality of pollen are described; these show that it is possible that self-pollination may occur even when the male flowers open first. Observations are given on local pollinating agents, and on the influence of manures on fertility.—*R. E. Holttum.*

6340. Gérôme, J. La reproduction par voie asexuée et la conservation de la panachure, chez certains vegetaux. [Vegetative propagation and the preservation of variegations.] Bull. Mus. Hist. Nat. [Paris] 28: 117–118. 1922.—The propagation by cuttings of 2 garden geraniums (*Pelargonium Mme. Salleron* and *P. Karoline Schmit*), resulted in plants in which leaf variegation persisted; but *Sansevieria trifasciata*, similarly treated, gave rise to plants with green leaves. *Phlox paniculata* and *Symphitum officinale*, both variegated, when grown from root cuttings produced offspring with green leaves.—*John M. Fogg, Jr.*

6341. Gérôme, J. Sur la conservation de la panachure, après bouturage de feuilles, chez certains végétaux. [The preservation of variegations in plants.] Bull. Mus. Hist. Nat. [Paris] 28: 547. 1922.—Leaf-cuttings of *Pelargonium Karoline* Schmit, a plant with variegated leaves, resulted in plants with green leaves. This result is believed not to have been obtained before except where root-cuttings were made.—*John M. Fogg, Jr.*

6342. Gérôme, J. Un cas curieux de retour ancestral chez le Pelargonium Madame Salleron. [A curious case of reversion in Pelargonium Madame Salleron.] Bull. Mus. Hist. Nat. [Paris] 28: 382–384. *Fig. 1.* 1922.—This paper calls attention to a garden geranium with 2 types of leaves, one large and green, the other smaller and variegated, approaching *Pelargonium zonale* in appearance. This is thought to be a reversion to the stock from which *P. Mme. Salleron* has been developed.—*John M. Fogg, Jr.*

6343. Graetz, Hugo. Problemen der Gladiolenzucht. I. [Problems of Gladiolus breeding. I.] Möllers Deutsch. Gärtnerzeitg. 40: 17–18. *3 fig.* 1925.—A popular review is given of the origin of some of the *Gladiolus* hybrids and varieties obtained by German and Dutch breeders.—*J. C. Th. Uphof.*

6344. Grove, A. Lilies in 1923. Gard. Chron. III. 75: 22–23. *Fig. 9–11.* 1924.—Growth, seasonal conditions and diseases for the year are noted.—*P. L. Ricker.*

6345. Hall, H. M., and Frances Long. Rubber plants. Carnegie Inst. Washington Year Book 23: 260. 1924.

6346. Hamel, Claude C. The Grenadilla. Florida Grower 30^{25}: 7. 1924.—*Passiflora edulis* has been grown for several years in Florida. The fruit is filled with a juicy, subacid, aromatic pulp; it ripens about May or June. *P. ligularis* has a better flavor, its white pulp being almost liquid, acidulous and perfumed. The fruit keeps its plump form and brings the highest prices.—*J. C. Th. Uphof.*

6347. Hawkins, Lon A. Investigations of the freezing of citrus fruits. California Citrograph 10: 181–182. 1925.—This is a report of an address in which the latest studies by the author are summarized. The average freezing point for Washington Navel oranges has been found to be about 28°F. with a range in different fruits from 26° to 28.9°. For Valencia oranges the average freezing temperature is about 28.3°F. with variations from 26.5 to 28.9°. For Thomson oranges the average freezing point is about 28.1°F. with a range from 27.3 to 29.0°. For lemons the average freezing point is around 28.3°F. and ranges from about 26.9 to 29.5°, small lemons freezing at slightly lower temperatures than larger ones. When the pulp of the fruit is frozen the cells are ruptured or the permeability of the membranes of the juice vesicles is changed so that when the pulp thaws the juice leaks out and water-logged areas appear on the segment walls. After 2–3 days, crystals usually appear between the segment walls in the water-soaked areas. These indications usually follow, even when the freezing is so slight that there is no subsequent drying out of the fruit.—*C. S. Pomeroy.*

6348. Heinemann, F. C. **Chrysanthemum indicum praecox.** Möllers Deutsch. Gärtnerzeitg. 40: 13–14. 1925.—This new race of *Chrysanthemum* may flower in the middle of June when sown in January of the same year. There are many color varieties. They keep long as cut flowers. Full grown plants can easily be potted and readily sold.—*J. C. Th. Uphof.*

6349. Hendrickson, A. H. **Pollination of new varieties of prunes.** Pacific Rural Press 109: 186. 1925.—This paper presents recent studies by investigators at the University of California on some of the newer varieties of plums and prunes, including Coates 1418, Jefferson and Silver.—*C. S. Pomeroy.*

6350. Hetschold, Ed. **Rosenneuheiten-Fragen.** [Questions on rose novelties.] Möllers Deutsch. Gärtnerzeitg. 40: 33–34. 1925.—The author asks whether it is of any value to breed semi-double flowers like Red Letter Day, and Red Star, since every friend of roses wants double flowering varieties. There are many new rose hybrids whose flowers are odorless; a scent is desirable.—*J. C. Th. Uphof.*

6351. Hodges, R. E. **Artificial rain-maker for oranges.** Pacific Rural Press 109: 222–223. 1925.—This is a statement of some of the methods of operation and the results secured in an orange orchard where an over-head sprinkling system has been in use for 2½ years. Some of the advantages said to have resulted from sprinkling for irrigation and other purposes include the prevention of June-drop by sprinkling on hot days, the avoidance of frost injury by sprinkling on cold nights, the elimination of red spider, mealy bugs and aphis and the greater aeration of the soil. Trees, fruit and labor are said to be saved by this system —*C. S. Pomeroy.*

6352. Hoff, Walter. **Holländischen Dahlienneuheiten.** [Dutch Dahlia novelties.] Möllers Deustch. Gärtnerzeitg. 39: 290. 1924.

6353. Jack, H. W. **Dwarf coconuts.** Malayan Agric. Jour. 12: 371–373. 1924.—This is a short note on the local cultivation of drawf coconut palms, with details as to yield.—*R. E. Holttum.*

6354. Kellogg, C. R. **Notes on sericulture in Fukien Province.** China Jour. Sci. & Arts 1: 59–63. 1923.—The author gives a short account of sericultural history followed by export figures showing the present unfavorable position of China as compared to other silk-producing and silk-exporting nations. China's backward condition is blamed to her neglect of science, particularly in regard to rearing the larvae and preparing the silk. A description is given of the 3 varieties of mulberries found in Fukien and of the native methods of mulberry culture, followed by a description of 3 varieties of silkworms raised in the districts near Foochow.—*M. L. Hancock.*

6355. Koch, C. H. **Beretning om Forsøg med Tilførsel af Kulsyre til Luften i Drivhuse i C. H. Kochs Handelsgartneri i Sommeren 1923.** [Report on tests with carbon dioxide fertilization in greenhouses in the nursery of C. H. Koch, summer 1923.] Gart. Tidende 39: 585–586. 1923.—In an untreated house the CO_2-percentage varied from 0.04 to 0.10; in 2 houses provided from steel flasks, 0.50–0.70 and 0.30–0.45, respectively; and in 1 house, where the CO_2 was developed from manure, 0.20–0.25. The CO_2 from steel flasks caused the loss of some of the leaves, probably due to some impurity. The production of cucumbers was raised 39% by the carbon dioxide manure.—*Ernst Gram.*

6356. Kordes, W. **Die schönsten einfachen und halbgefüllten Rosen.** [The best single and semi-double roses.] Möllers Deutsch. Gärtnerzeitg. 40: 6–9, 34. 1925.

6357. Lamprecht, H. **Torrsubstansbestämning i köksväkster.** [Dry matter determination in vegetables.] Nordisk Jordbrugsforskning 1923: 88–100. *Fig. 1–3.* 1923.—The common methods of preparation of pulp in very watery vegetables yield an excessive dry matter content because the circular saw throws a part of the sap away. Therefore a machine for the disintegration of the pulp has been constructed, with 2 cylinders, of which one rotates slowly, the other 3–4 times as fast. Cabbages and roots are cut in slices 1 cm. thick.—*Ernst Gram.*

6358. Lange, A. **Optegnelser og Bemærkninger om Havens Planter efter Vinteren 1923–24.** [Notes on plants after the winter of 1923–1924.] Haven 25: 5–9. 1925.—This is a statement of the hardiness of a multitude of trees and shrubs in a severe winter in Denmark.—*Ernst Gram.*

6359. Leske. **Chrysanthemum Neuheiten.** [Chrysanthemum novelties.] Möllers Deutsch. Gärtnerzeitg. 40: 12–13. 1925.

6360. Long, Frances. **Latex and lacticiferous tissue.** Carnegie Inst. Washington Year Book 23: 260–261. 1924.

6361. McKay, A. W. **Marketing Vermont maple-sap products.** Vermont Agric. Exp. Sta. Bull. 227. *1–48.* 1922.—This is a study of the maple sugar industry in Vermont with special emphasis on marketing the products. The study resulted in the formation of the Vermont Maple Products Cooperative Exchange, Inc.—*G. P. Burns.*

6362. Nilsson, E. **Undersökninger over möjligheten att vid laboratorieundersökninger bedöma sortsäktheten hos köksväkster. I. Kålväksterna och de til släktet Brassica hörande rotfrukterna.** [Investigations on the possibility of laboratory determination of vegetable seed. I. Cabbage and the root crops of the genus Brassica.] Nordisk Jordbrugsforskning 1924: 388–396. *1 diagr.* 1924.—The author describes 3 distinct types of cauliflower: Erfurter, belonging to type A, with strong anthocyan coloring of the hypocotyl; Frankfurter, to type B with slight color; and Lucullus, to type C, with practically no anthocyan. The common early varieties all belong to type A, the late to type B. The germs of Red cabbage are distinguished by their strong coloration, as compared with common cabbage. Of kale and kohlrabi, the anthocyan colored varieties are distinguishable already in the germ stage. Differences between the germs of common cabbage and brussels-sprout varieties were not discovered. Though it is possible from the germ to distinguish white or yellow flesh in turnip and swede, it is not possible to determine to which of the 2 varieties a sample belongs, since there is a considerable variation in the seed weight.—*Ernst Gram.*

6363. Pedersen, A. **Danmarks Havebrug og Gartneri.** [Horticulture and commercial gardening in Denmark.] Gart. Tidende 39: 552–557. 1923.

6364. Rideout, A. R. **Avocado but selection.** California Cultivator 63: 373, 377. 1924.—This is an account by a practical grower and nurseryman of the most satisfactory methods of budding and growing avocado trees.—*C. S. Pomeroy.*

6365. Riedel, Friedr. **Die Kohlensäuredüngung auf der Württembergischen Gartenbauaustellung.** [Carbon dioxid manuring in the Horticultural Exhibition, Wurtemberg.] Möllers Deutsch. Gärtnerzeitg. 40: 26–28. *4 fig.* 1925.—Commercial fertilizing with CO_2 was demonstrated for the 1st time in a horticultural exhibition at Wurtemburg. In an oven, charcoal was burned; the CO_2 gases evolved were washed and cooled. A small electro ventilator led the gases through pipes to the greenhouse where they were mixed with the air. Ferns, begonias, *Asparagus plumosus*, *Primula obconica*, *Heliotropium*, cucumbers and other species were much better developed with the CO_2 application than without it.—*J. C. Th. Uphof.*

6366. Rössler, H. **Die Düngung der Weinberge.** [Fertilizing mountain vineyards.] Mitteil. Deutsch. Landw. Ges. 40: 35–38. 1925.—Fertilizer requirements are discussed.—*A. J. Pieters.*

6367. Schneeperle, C. **Neue Zonal-Pelargonien.** [New Pelargonium zonale.] Möllers Deutsch. Gärtnerzeitg. 40: 3–4. 1925.

6368. Sevrin, H. **Dahlien-Neuheit Rapollo.** [A Dahlia novelty.] Möllers Deutsch. Gärtnerzeitg. 39: 290. *1 fig.* 1924.

6369. Waynick, D. D. **Growth rates of Valencia oranges.** California Citrograph 10: 196, 208. 1925.—This article presents summaries of measurements of 1235 outside fruits and 615 inside fruits on about 100 trees varying from 5 to 25 years of age, in 12 orchards in Orange County, California. The measurements were made monthly from September 1, 1924, to February 1, 1925. These studies will be continued during several seasons and data secured on soil moisture conditions in the same orchards.—*C. S. Pomeroy.*

6370. Wright, W. P. **Practical gardening for pleasure and profit. Vol. 2. Vegetables and their cultivation.** *365 p.* [Potatoes. *P. 314–329.*] The Educational Book Co.: London, 1922.—In this 6-volume publication, the article on potatoes is written primarily for the kitchen gardener rather than the commercial potato grower. The author compares the potato as a world's food plant with wheat and rice and presents data to substantiate the claim that in production, at least, it greatly exceeds wheat and rice. Brief mention is made of the

history and habitat, botanical relationship, structure and chemical composition of the potato. Cultural directions are given covering soil and nutrient requirements of the potato plant, varieties, quality of seed, tillage, intercropping, early lifting, etc. A select list of varieties suitable for forcing, and also outdoor, early, medium early, main-crop or late, and exhibition varieties is submitted at the close of the article. (See also Bot. Absts. 12, Entry 4077).—*W. Stuart.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 6149, 6198, 6199, 6204, 6239, 6293, 6296, 6298, 6339, 6637, 6693 6746, 6756, 6784)

6371. Anonymous. [Botanicus.] **A study of the wheat berry.** Nation. Miller **30:** 32–33. *1 fig.* 1925.—The author discusses the structure of the wheat spikelet and the process of pollination and morphology of the kernel.—*Carleton R. Ball.*

6372. Abele, H. **Untersuchungen an Gametophyten von Peperomia incana.** [The gametophyte of Peperomia incana.] Mez, Bot. Archiv. 7: 321–324. *6 fig.* 1924.—The haploid chromosome number is 11. The embryo-sac contains 16 nuclei, one being the egg nucleus and one the synergid. The remaining 14 nuclei are free. Fusion groups were not observed. Ephemeral cell plates are formed. The generative nucleus of the pollen is elongated in form.—*Carl Mez (transl. by William Seifriz).*

6373. Adderley, Albert. **The clinging power of single cotton hairs.** (British Cotton Indus. Res. Assoc.) Jour. Textile Inst. **13:** T 249–255. *Fig. 1–5, diagr.* 1922.—This investigation indicates that the clinging power of cotton hairs depends upon the convolutions, and presumably this power is a factor of importance in the spinning value of the cotton and the strength of the yarn spun from it, especially in soft twisted yarns.—This clinging power is a maximum when the convolutions of as many hairs as possible fit together perfectly. Perfect fitting may be obtained in 2 ways: (1) If the hairs have an equal number of convolutions evenly spaced along equal lengths; or (2) if hairs have varying total numbers of convolutions arranged in groups separated by unconvoluted spaces, the maximum clinging power is attained when the convolutions are identical in the different groups.—The variability of any variety of cotton ensures that this maximum clinging power is never realized in spinning and the strength of a yarn will therefore be less than the ideal conditions that (1) and (2) imply.—*From Author's smmary.*

6374. Arber, Agnes. **Myrsiphyllum and Asparagus: a morphological study.** Ann. Bot. **38:** 635–660. *46 fig.* 1924.—From a study of anatomy, abnormalities, etc., it is concluded that the phylloclades of *Myrsiphyllum* are prophylls of lateral shoots. The axes of these shoots are usually abortive but sometimes they continue to grow and produce scale-leaves with axillary phylloclades. The scale-leaves of *Asparagus* are interpreted as ligular sheaths and their spines as petiolar limbs. The needles of *Asparagus* are believed to be axial, the new evidence in this connection being the observation that they sometimes bear as many as 3 small scale-leaves.—*W. P. Thompson.*

6375. Barratt, Thos. **Some physical measurements on cotton fibres, and their graphical representation.** (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 13: T 220–228. *8 graphs.* 1922.—Measurements were made of the length, diameter, breaking stress, and extension at break of single cotton fibers from 2 kinds of Egyptian cottons. The data obtained are discussed and graphically represented.—(See also this issue, Entry 6396). *Frederick V. Rand.*

6376. Fuchs, A., and H. Ziegenspeck. **Aus der Monographie des Orchis Traunsteineri. III. Entwickelungsgeschichte einiger Deutscher Orchideen.** [Development of some German orchids.] Mez, Bot. Archiv. 5: 120–132. *Fig. 1–8.* 1924.—The author presents the complete developmental history of *Corallorhiza innata, Epipogium aphyllum, Spiranthes aestivalis* and *S. spiralis, Coeloglossum viride, Orchis Morio, Helleborine* (*Epipactis*) and *Neottia nidus avis.*—*Carl Mez (transl. by William Seifriz).*

6377. Furtado, C. X. **Branched coconut palms and their fertility.** Gard. Bull. Straits Settlements 3: 274–279. 1924.—The various types of branching in *Cocos nucifera* are reviewed. When true branching of the main stem occurs, the branches are usually fertile.—*R. E. Holttum.*

6378. Gadeau de Kerville, Henri. **Notes sur les fougères, sixième-onzième. [Notes on ferns, 6–11.]** Extrait du Bull. Soc. Amis Sci. Nat. Rouen (annees 1916–1921). *P. 225–321. Pl. 5–11, 16 fig.* Lecerf Fils: Rouen, 1922.—(6) Sections near the points of furcation in abnormally forked fronds of *Polypodium vulgare*, *P. punctatum*, and *Dryopteris Filix-mas* show anatomical structures wholly similar to those in fronds of species in which forking is normal (for example, *Platycerium grande*). The author regards forking in both as due to the same physiological causes. (7) Fronds of *Blechnum Spicant* intermediate between normal fertile and normal sterile fronds are described and are held to be reversions to an ancestral monomorphic type. (8) *Blechnum Spicant*, *Polystichum munitum*, and other simply pinnate species produce teratological forms in which the 2 basal pinnae become completely pinnate, the other pinnae remaining simple. In *Polystichum tripteron* Kze. this condition is normal. The author considers that it and species of similar habit are probably of teratological origin from simple pinnate ancestors. (9) Typical, and deeply cut, forked, and crested fronds of *Asplenium Nidus* and *A. Hemionitis* were found growing on the same rootstocks. (10) Great variations in outline of frond and form of pinnae were produced in plants of *Polystichum aculeatum* by exposing them to alternate periods of heat and cold. (11) Rootstocks of *Pteridium aquilinum* f. *undulatum* Bréb. (a variant given taxonomic recognition in many European floras), transplanted to a sunny garden, produced perfect fronds of the typical form of the species. From these 3 cases (notes 9, 10, and 11), the author argues that such variations have no taxonomic value and should not receive scientific names.—*C. A. Weatherby.*

6379. Gertz, Otto. **Vegetativ skottbildning i inflorescensen hos Hottonia palustris L. [Formation of vegetative shoots in the inflorescence of Hottonia palustris L.]** Bot. Notiser **1922:** 122–128. *Fig. 1–2.* 1922.—The specimen described had an unusually large number of flowers; there were 7 whorls of 5 flowers each, except the lowest whorl which contained only 4, the 5th being replaced by a vegetative shoot 4 cm. long ending in a bud, evidently intended for overwintering. The peduncle had apparently been wounded at the node and become bent and submerged, which probably had caused the abnormality. Explanations of the figures and a summary in German are given.—*P. A. Rydberg.*

6380. Heinricher, E. **Das absorption system der Wacholdermistel (Arceuthobium oxycedri (DC.) MB.) mit besonderer Berücksichtigung seiner Entwicklung und Leistung. [The absorption system of the juniper mistletoe, Arceuthobium oxycedri, with particular reference to its development and function.]** Sitzungsber. Akad. Wiss. Wien [Math. Nat. Kl.] Abt. I. **132:** 143–194. *7 pl. 13 fig.* 1924.—The absorption system of *Arceuthobium* develops from the hypocotyl; the embryo, as in other Loranthaceae, is devoid of a root. At first an irregular mass of tissue is produced beneath the bark of the host, from which strands invade the wood. There is at this time no external outgrowth. After a thalloid body of considerable extent is developed, adventitious buds appear externally on which reproductive organs are produced.—The point of infection becomes marked by a spindle-shaped enlargement of the twig. The wood of the host, in particular the rays, is traversed by parasitic strands; certain narrow ones extending nearly to the growing point and keeping pace with it. The younger parts of these strands contain chlorophyll bodies which function, in all probability, as leucoplasts and in the regulation of osmotic relations. Growth between the host cells seems to be accomplished by enzymatic action accompanied by high turgor in the strand cells. The parasite also seems to induce restricted or delayed lignification in the parts it invades. In the multiseriate strands some differentiation into specialized water conducting elements is visible, and the radial strands in particular possess storage tracheids which afford communication between the host tracheids and the central conductive part of the strand.—*Arceuthobium* is regarded as a hemiparasite, appropriating not only water and minerals, but also starch from its host. However, the Juniper is very tolerant of its injury, showing marked pathological symptoms only after a number of years. One of the immediate pathological effects is the appearance and persistence of albuminous cells in the phloem of the host.—*F. Weiss.*

6381. Herrmann, H. **Vergleichende Holzanatomie der Pappeln und Baumweiden. [Comparative anatomy of the poplars and willows.]** Mez, Bot. Archiv. **2**: 35–56, 79–112. *Fig. 1–12.* 1922.—The wood of *Populus* and *Salix* is anatomically distinguished with great difficulty. *Populus tremula, P. alba, P. canadensis,* and *P. nigra, Salix caprea, S. alba, S. fragilis, S. pentandra,* and *S. daphnoides* were studied. All these species can be anatomically distinguished. A key is given. The generic differences are as follows. *Populus:* Medullary rays mostly of same height; palisade cells twice as high and always lying at the edge of, never in the center of, a medullary ray. *Salix:* Medullary rays always composed of palisade and connective cells; palisade cells at the edge and in the center of rays.—*Carl Mez (transl. by William Seifriz).*

6382. Huber, J. A. **Zur Morphologie von Mesembrianthemum. [Morphology of Mesembrianthemum.]** Mez, Bot. Archiv. **5**: 7–25. *26 fig.* 1924.—A comparison of the shoot forms shows that in all cases the main shoot is terminated by an inflorescence, which may often contain but one flower, and may, through sympodial growth, become lateral. Anisophylly, like hypotrophy, of the shoot is dependent especially upon light. Leaf form is chiefly dependent upon available space in the bud. Capacity of the leaves for regeneration extends only to the ability to form roots. Flower development follows the type in Cistaceae. After the laying down of the scale leaves, the fruit and flower leaves arise in basipetal series. The 'anlage' of the placenta is always axial. The seed 'anlage' is campylotropous. Only the inner integument forms the micropyle. The nucellus possesses at the apex a nucellar cap. The fusion of the polar nuclei takes place (in contrast to the condition in the Cactaceae) before fertilization. The nutrient material is formed from the perisperm. The fruits are opened by swelling due to moisture. Seed dispersal is accomplished by rain.—*Carl Mez (transl. by William Seifriz).*

6383. Lohse, R. **Entwurf einer Kritik der Thyllenfrage mit Ergebnissen einiger Versuche. [Concerning tyloses.]** Mez, Bot. Archiv. **5**: 345–380. *5 pl.* 1924.—External factors never cause tyloses; they may retard it. Correlative stress differences are the cause of tyloses. Equilibrium disturbances of this sort come about in the production of new surfaces following wounding or death of parts, or from cells or tissue becoming independent due to age.—*Carl Mez (transl. by William Seifriz).*

6384. Lüdi, W. **Abnorme Bildung einer Clivia-Blüte. [Teratological Clivia flowers.]** Mitteil. Naturf. Ges. Bern **1924**: IL–L. 1925.

6385. Moenikes, A. **Zur Frage der Harzbildung bei den Umbelliferen-, Compositen-, und Araliaceenwurzeln. [Resin formation in roots of Umbelliferae, Compositae and Arabaceae.]** Mez, Bot. Archiv. **5**: 91–109. *7 fig.* 1924.—Just as in the Coniferae, it is impossible to locate in the above named families what Tschirch calls "paradigmata" in his theory of resin production in a resinogenous layer surrounding the resin canals. The secretion is formed in the tapetal cells of the schizogenous resin canals and directed through the wall into the resin duct.—*Carl Mez (transl. by William Seifriz).*

6386. Moss, E. H. **Fasciated roots of Caltha palustris.** Ann. Bot. **38**: 789–791. *5 fig.* 1924.—Three of the 4 abnormal roots showed a band-like stele with numerous protoxylem and phloem groups. One possessed 2 steles, each enclosed in an endodermis and with typical tetrarch structure.—*W. P. Thompson.*

6387. Neumayer, H. [No title.] Verhandl. Zoöl. Bot. Ges. Wien **73**: 49. 1923.—*Xanthoria parietina* and *Cladonia* show lignification although Molisch states that in Thallophytes and Bryophytes this does not occur.—*J. C. Th. Uphof.*

6388. Nodder, C. R. **A study of flax and kindred fibres. I. Some observations on the behaviour and structure of textile fibres, with an account of a convenient method of distinguishing flax from hemp.** (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. **13**: T 161–171. *Pl. 1–3.* 1922.—Fibers of ramie and flax twist in a clockwise manner on drying; hemp and jute in the reverse direction. Microscopic examination of these fibers, after subjection to a certain treatment, shows a fibrillar structure. In flax and ramie the fibrils are arranged in left-handed spirals; in hemp and jute, in right-handed spirals.—*Frederick V. Rand.*

6389. Nodder, C. R. **A study of flax and kindred fibres. II. Further observations on flax (and cotton) fibres. Probable relationships between "stomata" and "slow spirals" of cotton**

and "dislocation marks" of flax. (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 13: T 213–219. *Pl. 1–2.* 1922.—A great similarity in structure was found between cotton and flax fibers in spite of the fact that they are not homologous. It is probable that the properties of cellulose play a large part in determining structure in vegetable fibers.—Very similar "dislocation marks" were found in cotton and in flax. The nature of the "stoma" of de Mosenthal and the "slow spirals" of Balls was elucidated by comparing cotton and flax fibers.—Minute pores were found in the cell walls of both cotton and flax fibers.—*Frederick V. Rand.*

6390. Parkin, J. Stomata and phylogeny. Ann. Bot. 38: 795–796. 1924.—In Bennettitales there is a pair of subsidiary cells parallel to the guard-cells of the stomata. The Magnoliaceae and allied families as well as the Gnetales have a similar type of subsidiary cell. This is regarded as significant from the standpoint of the phylogeny of angiosperms.—*W. P. Thompson.*

6391. Pfeiffer, H. Kritische Untersuchungen über die Entstehung der Zuwachsringe und der Xylem-Zerklüftung bei Erycibe Roxb. [The rings of growth and xylem fission in Erycibe.] Mez, Bot. Archiv. 5: 171–176. 1924.—The phloem parenchyma and not the pericycle is the region of new growth. Later the xylem parenchyma becomes active in dilatation division. The still non-woody pith then follows with division at its periphery. This later gives rise to a meristem for the inner phloem of the (bicolateral) bundle. A mathematical determination of the energy yielded by the initials in dilatation is sought.—*Carl Mez (transl. by William Seifriz).*

6392. Porterfield, W. M. A new feature in vascular anatomy as displayed by bamboo, particularly by the young sheath leaf. China Jour. Sci. & Arts 1: 273–279. *9 fig.* 1923.—A study was made of the anatomy of the growing points of *Phyllostachya nidularia* Munro. Particular attention is called to the transverse barred plates, or "craticulae," which occur in the annular tracheae. Their function is said to be entirely mechanical. They are supposed to "furnish support and protection against the binding of the older sheaths on the outside and the expanding growing point on the inside." These bars are reported as new to histological writings.—*Albert N. Steward.*

6393. Ribstein, Wolfgang. Zur Kenntnis der im alten Aegypten verwendeten Hölzer. [The woods of ancient Egypt.] Mez, Bot. Archiv 9: 194–209. *Fig. 1–10.* 1925.—The author investigated the collections of 3 Egyptological museums and found them to be made of the following woods; *Abies* sp., *Cedrus Libani, Juniperus* sp., *Salix* sp., *Ficus sycomorus, Acacia nilotica, Aeschynomene* sp., *Zizyphus* sp., *Tamarix* sp., *Mimusops* sp., *Acacia* (?) sp., and *Oncoba* (?) sp.—*William Seifriz.*

6394. Rühle, K. Beiträge zur Kenntnis der Gattung Prunus. [The genus Prunus.] Mez, Bot. Archiv. 8: 224–249. *3 pl.* 1924.—In the young gynoecium of *Prunus*, hairs are formed which are either found on the outside of the pericarp or in the ovary cavity. The form and appearance of the hairs depends upon the species. The hairs are unicellular except in *P. avium* where, in the seed cavity, multicellular hairs appear. The first development of the integument starts where the seed cavity gives sufficient room. The integument furrows are, at their closed ends, blocked by cells which are either wedged-shaped or isodiametric. The development of the embryo sac is normal. The following tissues are discernible in the nucellus: the peculiar, plasma-poor chalaza tissue; above this the richer nutrient layer which during nourishment of the embryo is dissolved by a chalazal haustorium; 5 basal cells; the richly protoplasmic, small-celled "bridge," by means of which nourishment is conveyed to the embryo-sac; the embryo-sac end cells; the normal embryo-sac; the "Kalotten" or head cells poor in protoplasm, whose fate differs in different species; the epidermal hood which plays a role in the guiding and nourishment of the pollen tube; and the spongy tissue of the nucellus poor in protoplasm. The integument is made up solely of thin-walled, parenchymatous tissue. Of the several seed anlage laid down, but one develops. *P. armeniaca* is an occasional exception. Of the 2 fully grown integuments, usually only the outer develops into the testa.—*Carl Mez (transl. by William Seifriz).*

6395. Schmidt, A. Histologische Studien an phanerogamen Vegetationspunkten. [Histological studies on phanorogamic growing points.] Mez, Bot. Archiv 8: 345–404. *12 pl.*

13 fig. 1924.—Form changes in growing points can be measured accurately in plants with decussate leaf arrangement. These changes are grouped in periods, each covering the duration of a "plastochron." Each plastochron is delimited by maximum and minimum surfaces. Within each plastochron the growing point shows more or less distinct morphological metamorphosis. The promeristem of the growing point is differentiated into "tunica" and "corpus." The tunica comprises the entirety of the peripheral layers of the growing point. In this region leaf primordia originate but, otherwise, periclinal divisions do not take place. *Vinca minor* and *Veronica speciosa* have 3 tunica layers; *Veronica myrtifolia* and *Syringa vulgaris* have 2, and *Scrophularia nodosa*, only one. The tissue enclosed by the tunica is called the corpus. The peripheral cells of this tissue show at certain stages regular arrangement in definite layers, but sooner or later, during a plastochron it is split up into 2 regions. The growing point of *Scrophularia nodosa* represents a new type of phanerogamic apical growth. There are plants which show the typical triple division of the growing region (Hanstein), as for example *Vinca minor* and *Veronica speciosa*. In other plants different conditions prevail. Dermatogen is always found but in *Scrophularia nodosa* a periblem and plerom is certainly not distinguishable. In the development of organs, certain tunica layers are divided. In the development of leaves, 2–3 tunica layers, with sometimes additional corpus elements, are used. This depends on the size of the tunica and the thickness of the leaf primordia. There is no stereotyped system for the development of the axillary members of dicotyledons. This development is often combined with that of a plate-like zone of cells which probably acts as tissue for elongation.—*Carl Mez* (*transl. by Mary K. Bryan*).

6396. Shorter, S. A. **Some physical measurements on cotton fibres, and their graphical representation.** (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. **13**: T 272–273. 1922.—This is a criticism of a paper with the same title by Barratt. (See also this issue, Entry 6375.)

6397. Sinz, P. **Bau, Wandlungen und Neubildungen der sekundären Rinde der Cupressineen.** [Formation, change, and repair of secondary bark in the Cupressineae.] Mez, Bot. Archiv. **8**: 40–63. *8 pl., 6 fig.* 1924.—In the secondary bark of the Cupressineae, a proterogenous and a hysterogenous zone are to be distinguished; the former encloses the latter. The hysterogenous bast parenchyma arises through later division of the proterogenous, under the influence of growth in thickness and a coincidently occurring physiological need. It has not solely the function of closing the clefts of the split proterogenous bark, but serves also for storage of starch and water. With the exception of *Callitris* the hysterogenous bark stretches over more annual rings than does the proterogenous. The water tissue stands in indirect proportion to the assimilation tissue. The latter is proportional to the degree of xerophytism. The resin ducts are also products of the hysterogenous bark in the Cupressineae. They arise schizogenously from bast parenchyma.—*Carl Mez* (*transl. by William Seifriz*).

6398. Sinz, P. **Calciumoxalat-Kristalle als Bausteine im mechanischen System der Cupressineen-Rinde.** [Calcium oxalate crystals as structural elements in the mechanical system of the cortex in Cupressineae.] Mez, Bot. Archiv **10**: 10–16. *4 fig.* 1925.—The abundant depositions of calcium oxalate in the cortex of the Cupressineae represent construction elements compared by the author to concrete walls. These elements effectively withstand the horizontal pressures which are everywhere active.—*Carl Mez* (*transl. by F. V. Rand*).

6399. Staudermann, W. **Die Haare der Monokotylen.** [Hairs of the monocotyledons.] Mez, Bot. Archiv. **8**: 105–184. *20 pl.* 1924.—From a study of hairs of all monocotyledonous families an attempt was made to discover family characteristics. Orders exist which can be regarded as unified groups on the basis of morphological characters of the hairs. Such are Helobiae, Glumiflorae, (Juncaceae excepted), Enantioblastae, Scitamineae, Colchicaceae, Liliaceae, Convallariaceae, and Iridaceae of the Liliiflorae. Not unified are the Amaryllidaceae, Haemodoraceae, Smilaceae, Dioscoreaceae, and Bromiliaceae of the Liliiflorae, Spadiciflorae, and Orchidaceae.—*Carl Mez* (*transl. by William Seifriz*).

6400. Stolt, K. A. H. **Zur Embryologie der Gentianaceen und Menyanthaceen.** [The embryology of the Gentianaceae and Menyanthaceae.] Kungl. Svenska Vet. Akad. Handl. **61**[14]: 1–55. 1921.—The early embryology of these 2 families is very similar, but in the later development the following differences become apparent: In the Gentianaceae the mature

embryo-sac is either elongated, oval or rounded; the integumental tapetum is wanting; the antipodal cells are usually more than 3 in number and strongly developed; the spindle in the primary division of the endosperm nucleus may be variously oriented; the endosperm is nuclear. In the Menyanthaceae, on the other hand, the embryo-sac is always narrow and elongated, though sometimes extended at the micropylar end; an integumental tapetum is present; the antipodal cells are always 3 in number and degenerate early; the spindle in the primary division of the endosperm nucleus is always oriented in the longitudinal plane of the embryo-sac; the endosperm is cellular. Thus the 2 families differ not only externally but also in the development of the embryo-sac and above all in the different mode of endosperm formation. The difference between the 2 families is greater than has been hitherto thought and it is justifiable to keep them separate.—*Ernst Artschwager.*

6401. Stout, A. S. **Avocado studies—pollination and setting of fruit.** Florida Grower 31[4]: 6–7. 1925.—The flowers of all varieties are perfect. The lower is open for some time before the pollen is shed at which time the pistil is frequently brown and black. In the Fuerta variety, the flowers usually begin to open in the afternoon between 2 and 5 o'clock. They soon become widely open, with the perianth and all the stamens spread out at right angles to the slightly crooked pistil. Such a flower usually remains open during the night and does not fully close until from 8 to 10 o'clock on the following morning. This flower remains closed the rest of that day and during the following night, but opens for the 2nd time during the next day. At some time during the 2nd period of opening, the pollen is shed by the opening of valves. When a Fuerta tree stands alone, or when a group of these trees are standing together, there is very little opportunity for the flowers to be pollinated at the time when the pistils are more ready to receive pollen. Under such conditions, cross-pollination with some other variety is necessary if many fruits are to set.—*J. C. Th. Uphof.*

6402. Stroebel, F. **Die Obdiplostemonie in den Blüten.** [**Obdiplostemony in flowers.**] Mez, Bot. Archiv. 9: 210–224. *6 pl.* 1925.—Obdiplostemony in flowers arises through the addition of sepal sectors, and may manifest itself in the construction of larger primordia in the early stages of development, either with or without higher insertion. The first case may be regarded either as the beginning or disappearance of this variation. In the less advanced sectors there is a tendency to reduction. A sectorial analysis of the flower is in harmony with staminodial structures; they need not be considered as members of the leaf whorls on the point of disappearing, a transition from the polyandrous type of flower. The development of the organ-primordia is acropetal; the slight insertion differences are due to space relations existing at early stages. Celakowsky, author of the theory of the basipetal origin of the androecium in obdiplostemonous flowers, says that in the flowers of Oxalidaceae and Caryophyllaceae, in which the stamen whorls are reduced almost to one, his attempts at explanation have encountered difficulties. These, however, do not stand in the way of the comparative observations of the author.—*Carl Mez (transl. by F. V. Rand).*

6403. Wassermann, J. **Beiträge zur Kenntniss der Spaltöffnungen.** [Stomata.] Mez, Bot. Archiv. 5: 26–69. *Fig. 1–52.* 1924.—Development of the stomata is the same on cotyledon, primary leaf, and metaphyll. There is progressive thickening of the guard cells from the cotyledons to the primary leaves and the metaphylls. The same is true for the external wall of the epidermal cells. The stomata of the bracts and floral leaves are much more simply formed than those of the trophophylls. The stomata of the tendrils, rachides, petioles, and shoot axes are usually more xerophyllous than the leaf stomata. The stomata can be so influenced as to cause the reappearance of the juvenile form. Pathological stomata such as half stomata, twins, and triplets, can be experimentally produced. Darkness has no influence on size of stomata but does decrease thickening, alter the depth of depression, and raise the guard cells above the level of the epidermis. Moisture, in the presence of light, causes an increase in size and raises the stomata above the epidermis. Moisture in the dark produces mammoth stomata which are raised high above the epidermal level. Culture under water can render the stomata completely functionless. The last 3 phenomena are supposedly caused by depression of transpiration and increased turgor of the guard cells, and perhaps also of the adjoining cells. The author believes that the stomatal apparatus is not of great phylogenetic value since it can be too easily influenced by external conditions.—*Carl Mez (transl. by William Seifriz).*

6404. Wolff, G. Ph. **Zur vergleichenden Entwicklungsgeschichte und biologischen Bedeutung der Blütennektarien.** [Comparative anatomy and biological significance of nectaries.] Mez, Bot. Archiv. 8: 305–444. *12 pl.* 1924.—The aggregation of sugar and the secretion of nectar in flowers is the outcome of the rich collection of nutrient material in the flower, which, however, cannot be regarded as necessary to the growth and development of the flower, but is probably of value to the whole of the life processes of the plant during flowering time. This assumption is supported by the abundance of floral nectaries and scarcity of extra-floral nectaries. The latter and also the nectaries on the leaf edge of ferns tend to support the belief that honey secretion in the flowers did not originally come about as an adaptation for securing pollination.—*Carl Mez (transl. by William Seifriz).*

6405. Yamasaki, Morimasa. **Uber das Erscheinen von Anomalien bei Reispflanzen.** [The appearance of anomalies in rice plants.] (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 2: 31–38. *3 fig.* 1923.—Among the anomalies observable in plants are a few the appearance of which may be artificially prevented. Thus, in rice there is an anomalous race known in Japanese as the "Moture" in which the culms bend down instead of standing erect, as in normal plants. If such an anomalous race is grown in poor soil the anomaly appears only at the beginning of development and soon disappears. Another example is a race with brown flecks on the leaves, which also almost disappear in poor soil. There is also a race with purple culms and leaves, caused by anthocyanin in the epidermal cells. Under unfavorable light conditions this race is green, as in normals, except for the 1st leaf. If rice is grown in a greenhouse, flower anomalies are observed in many varieties, which never occur in nature, such as the enlargement of the glumes and of the ordinarily minute glume rudiment. If the glumes become so large that they equal the lemma, the palea becomes small, often splits into 2 or 3 pieces and sometimes entirely disappears. In many cases there are 2–3 pistils and 7–9 stamens, as in sterile plants. The culm sometimes branches near the ground, though only in the greenhouse and never in nature. The author mentions a few anomalies which are not influenced by the environment.—*Author (translated).* (*Courtesy Japanese Jour. Bot.*)

6406. Ziegenspeck, H. **Die Stelärtheorie und der serologische Stammbaum.** [The stelar theory and the serological family tree.] Mez, Bot. Archiv 10: 4-10. 1925.—The stelar theory is revised as follows: The simplest structure of a stem is attained in the haplostele. The first and rather unimportant advance is found in its becoming hollow, that is, in the origin of a pith. This is called a siphonostele. This process can be explained physiologically on the basis of a greater mechanical strength. The siphonostele develops gaps where the leaf traces pass out. These become larger and larger so that a net-work of bundles arise in the stem, the dictyostele. If the stem bundles become entirely replaced so that the central cylinder appears to be formed only of fusing leaf trace bundles the eustele results. When the leaf trace bundles are deflected inwards, to fuse externally, the type results that is especially to be found in the monocotyledons,—the atatktostele. Up to the atatktostele all types are capable of normal growth in thickness. The haplo- and siphonostele grow in thickness only by means of the fascicular cambium, the dictyostele and eustele require the occurrence of interfascicular cambium, that is, adventitious cambium. The atatktostele can grow in thickness only with adventitious cambium. Peculiarities occur, furthermore, in the complicated dictyostele of the Medulloseae and of the Cycas-type. The amphiphloic syphonostele is derived from the siphonostele by the occurrence of phloem on the side directed toward the pith. From this originates the meristele through degeneration, since each portion is converted into a haplostele as a result of the fusion of the sieve elements. These haplosteles may then repeat the same process as a result of which very complicated structures arise. Through the disintegration of the haplostele in plates, and the coming in of sieve elements between the woody parts, the flat bundles of *Lycopodium* arise.—This development of the stelar structure has now been investigated by serological methods. In this way a good picture of the development of vascular structure is achieved by study of geological strata and of the serological series. From this it may be concluded, as generally in the domain of genetics and of phylogeny, that the primitive is to be found at the beginning of the development of a series and the complicated at the end.—*Carl Mez (transl. by Chas. Drechster).*

6407. Ziegler, Anton. **Beiträge zur Kenntnis des Androeceums und der Samenentwicklung einiger Melastomaceen.** [The androeceum and seed development in the Melastomaceae.]

Mez, Bot. Archiv. 9: 398–467. *Fig. 1–229.* 1925.—The stamens are laid down after the other floral parts. In the large-flowered forms the filaments are geotropically responsive. The seed anlage are amphitropic to anatropic. There are 2 integuments, the inner consisting of 2 cell layers, the outer of 2–4. The development of the macrospore mother-cell is normal. No permanent endosperm is formed.—*Carl Mez (transl. by William Seifriz).*

6408. Zinke, W. Ueber das Assimilationsgewebe der Monokotylen und seine Verwendung in der Frage ihres systematischen Anschlusses. [The bearing of the assimilation tissue of monocotyledons on systematic relationships.] Mez, Bot. Archiv. 5: 74–91. 1924.—That the assimilation tissue of the palisade layer of monocotyledonous leaves is not fully developed is frequently to be observed in the water leaves of the Helobiae and the air leaves of Glumiflorae, Bromeliaceae, Liliiflorae, and Orchidaceae. There is not a single family characterized by lack of palisade tissue among the autotrophic terrestrial monocotyledons. Helobiae with air leaves show dicotyledonous mesophyll structure in that they exhibit differentiation between palisade and spongy parenchyma. Assimilation cells of the monoctoyledons have no fixed form but are correlated with the shape and structure of the leaf. Those with increased length or width owe their form to direction of growth of the leaf, as determined by the venation. The fact that the palisade layer is often lacking in parallel veined leaves and that undifferentiated mesophyll structure exists in aquatic leaves, is believed to be due to reduction of formerly morphologically differentiated leaves of the ancestors of the monocotyledons, due to the influence of aquatic life. Starch and sugar production in the monocotyledon leaf bears no relation to the development of chlorophyll tissue.—*Carl Mez (transl. by William Seifriz).*

MORPHOLOGY AND TAXONOMY OF ALGAE

Wm. Randolph Taylor, *Editor*

(See also in this issue Entries 6145, 6178, 6179, 6183, 6192, 6213, 6489, 6641, 6645)

6409. Borge, O. Prasiola fluviatilis (Sommerf.) Aresch. funnen i Sverge. [Prasiola fluviatilis in Sweden.] Bot. Notiser 1922: 174. 1922.—This species has been found in Norra Sarek, Lule Lappmark.—*P. A. Rydberg.*

6410. Deflandre, G. Additions à la flore algologique des environs de Paris. [Additions to the algal flora of the Paris region.] Bull. Soc. Bot. France 71: 910–921. *7 fig.* 1924.—Of the 135 desmids listed the following are new: *Closterium angustatum* var. *multinucleatum, C. costatum* var. *multinucleatum, C. Ulna* var. *multinucleatum, C. lineatum* var. *multinucleatum, C. intermedium* formae, *Tetmemorus granulatis* var. *basichondra* f. *major.* New to France are: *Gonatozygon Kinahani, G. monotaenium* var. *pilosellum* Nordst., *Closterium didymotocum* f. *maxima* Grönbl., *C. turgidum* var. *Borgei* Nob., *Cosmarium Phaseolus* var. *elevatum* Nordst. *C. pseudoconatum* f. Lütkemüller, *C. Regnellii* f. Borge, *Xanthidium concinnum* var. *Boldtiana* West, *Arthrodesmus subulatus* var. *subaequalis* W. & G. S. West, *A. trispinatus* West, and *Staurastrum oxyacanthum* Arch. For the region of Paris the following are new: *Penium margaritiferum, Closterium Malinvernianum* deNot, *C. peracerosum, C. attenuatum, C. turgidum, Tetmemorus levis, Micrasterias apiculata, Cosmarium pachydermium* Lund, *Closterium perforatum* Lund, *C. Regnesii* Reinnsch, *C. Boeckii* Wille, *Cosmarium costatum* Nordst., *C. ovale* Ralfs, *Staurastrum inconspicuum* Nordst., *S. laeva* Ralfs, and *Sphaerozosma granulatum* Roy. & Bes.—*H. des Gayets.*

6411. Gaidukov, N. Weitere Beiträge zur Oekologie der Süsswasseralgen. [The ecology of fresh water algae.] Mez, Bot. Archiv 9: 103–111. 1925.—The author lists, describes, and gives the distribution of the species found near Rjasan.—*William Seifriz.*

6412. Ghose, S. L. A systematic and ecological account of blue-green algae from Lahore and Simla. Jour. Linn. Soc. Bot. London 46: 333–346. *Pl. 31.* 1924.—Blue-green algae are found at Lahore mostly as subaerial forms; the little plankton of the rain pools quickly disappears. During May and June the forms are exposed to extreme heat and dryness. In Lahore the vegetative season is August–February while the fruiting season is February–April. At Simla the vegetative period is June–October and the fruiting period is Septem-

ber–November. The following are described as new: *Chamaesiphon filamentosa, Phormidium truncicola, Arthrospira spirulinoides, Lyngbya Kashyapii, L. truncicola, Anabaena gelatinosa, Aulosira fertilissima, Scytonema Fritschii* and *Tolypothrix campylonemoides.—Wm. Randolph Taylor.*

6413. Goldsmith, G. W., and Lee Bonar. **Distribution and behavior of soil algae.** Carnegie Inst. Washington Year Book 23: 261. 1924.—Cultures made from March to late summer showed growth of algae from about 80% of the samples, which came from a wide variety of habitats. The algae obtained have been chiefly blue-greens and 1-celled Chlorophyceae, with *Ulothrix variabilis* the only common exception. *Nostoc minutum* and *N. aureum* were obtained only from the alpine climax, in accord with their reported occurrence only from the Arctic and Alaska. In general, samples from the alpine area have shown growth only from the surface level, while those from lower areas have shown growth from samples at a depth of 4–12 inches.—*Wm. Randolph Taylor.*

6414. Ishikawa, M. **On the phylogeny of the Rhodophyceae.** (Japanese with English summary.) Bot. Mag. Tôkyô 38: (159)–(167), 130. 1924.—A study of the nucleus, chromatophore and pigment of *Prasiola* indicates that the Schizogoniales belong to the Bangiales, although lacking phycoerythrin and phycocyanin. *Thorea* and *Compsopogon* must be separated from the Bangiales. *Thorea* is related to the Helminthocladiaceae or the Chaetangiaceae, while *Compsopogon* belongs to the Lemaneaceae. The Florideae are derived from the Cyanophyceae through the Bangiales and the Rhodophyceae-Cyanophyceae line is not connected to the Chlorophyceae-Flagellatae line.—*Wm. Randolph Taylor.*

6415. Jörgensen, E. **Mediterranean Dinophyseae (Peridineae).** Rept. Danish Oceanogra. Exped. 1908–1910. No. 7, 2^2: 1–48. *64 fig.* 1924.—Described as new are: **Pseudophalocroma** n. gen., *Paradinophysis* n. sect., *Euphalacroma* n. sect., *Cuneus* n. sect., *Argus* n. sect., *Podophalacroma* n. sect., *Urophalacroma* n. sect., *Phalacroma elongatum* n. sp., *Dinophysis punctata* n. sp., *D. alata* n. sp., *Scolops* n. sect., *Ornithoceras assimilis* n. sp.—"Winter-species" are few and rare, but 14 species are known only in summer and these are subtropical and mostly live below the surface. Most of the species immigrate from the Atlantic and probably especially in 1 or more of the months February, June and September, perhaps also January. True endemics are rare, and generally from deep water. Immigration from the Black Sea, which has fresher water and a different flora, is doubtful. The general flora is warm-temperate and northern species are few, really cold-water species being entirely absent. —*Wm. Randolph Taylor.*

6416. Kylin, Harald. **Studien über die Delesseriaceen.** [Study of the Delesseriaceae.] Lunds Univ. Arsskrift. N. F. Avd. 2, 20^6: 1–111. *80 fig.* 1924.—This is essentially a systematic revision of the family based on a morphological reinvestigation of many of the important species. The parts of the family considered are divided into 2 subfamilies: Delesserieae, with secondary groups Hemineura (genus *Hemineura*); Hypoglossum (genera **Brachioglossum** n.g., *Hypoglossum*, **Bartoniella** n.g., *Chauvinia, Phitymorpha, Botryocarpa*), Membranoptera (genera *Membranoptera, Pantoneura, Microrhinus, Holmesia*), Grinnellia (genus *Grinnellia*), Delesseria (genera *Aploglossum, Delesseria*); Nitophylleae with secondary groups Pseudophycodrys (genus *Pseudophycodrys*), Phycodrys (genera **Rhizoglossum** n. g., *Erythroglossum*, **Polyneura** n. g., *Phycodrys, Halicnide, Heterodoxia, Anisocladella, Cladodonta*, **Heteronema** n. g., *Pachyglossum*, **Chondrophyllum** n. g.), Ruprechtiella (genera **Ruprechtiella** n. g., **Hypophyllum** n. g.), Myriogramme (genera **Myriogramme** n. g., **Goniocolax** n. g., *Polycoryne, Platyclinia*, **Schizoseris** n. g., *Neuroglossum*), Nitophyllum (genus *Nitophyllum*), Cryptopleura (genera *Acrosorium, Hymenena, Cryptopleura, Botryoglossum, Gonimophyllum*).—Unless otherwise stated, the following are new combinations made: *Brachioglossum Woodii* (J. Ag.), *B. crispatulum* (Harv.), *Bartoniella crenata* (J. Ag.), *Phitymorpha linearis* (Laing), *Membranoptera platyphylla* (Setchell & Gardner), *M. denticulata* (Mont.), *M. tenuis* n. sp., *Pantoneura rostrata* (Lyngb.), *P. Baerii* (Post. & Rupr.), *P. corymbosa* (J. Ag.), *P. angustissima* (Griff.), *P. Juergensii* (J. Ag.), *Rhizoglossum thysanorhizans* (Holmes), *R. adriaticum* n. sp., *R. reptans* (Zanard.), *Erythroglossum Sandrianum* (Zanard.), *E. intermedium* (J. Ag.), *Polyneura Hilliae* (Grev.), *P. litterata* (J. Ag.), *P. latissima* (Harv.), *P. Gmelinii* (Grev.), *Phycodrys fimbriata* (DeLaPyl.), *Heteronema Andersonii* (J. Ag.), *H.*

borealis n. sp., *Pachyglossum proliferum* (J. Ag.), *Chondrophyllum monanthos* (J. Ag.), *Ruprechtiella crassifolia* (Rupr.), *Hypophyllum Middendorfii* (Rupr.), *Myriogramme minuta* n. sp., *M. carnea* (Rodr.), *M. versicolor* (Harv.), *M. spectabilis* (Eaton), *M. multiloba* (J. Ag.), *M. Bonnemaisoni* (Grev.), *M. livida* (Hook. f. & Harv.), *M. Smithii* (Hook. f. & Harv.), *M. Crozieri* (Hook. f. & Harv.), *M. undulata* (Kütz.), *M. multinervis* (Hook. f. & Harv.), *M. Gattyana* (J. Ag.), *M. undulatissima* (J. Ag.), *M. denticulata* (Harv.), *M. Gunniana* (Harv.), *M. pristoidea* (Harv.), *M. serrulata* (J. Ag.), *M. crosa* (Harv.), *Gonimocolax australis* (Skotts.), *Schizoseris laciniata* (Kütz.), *S. dichotoma* (Hook. f. & Harv.), *S. Davisii* (Hook. f. & Harv.), *Acrosorium venulosum* (Zanard.), *A. reptans* (Crouan), *A. acrospermum* (J. Ag.), *A. corallinarum* (Nott.), *A. uncinatum* (J. Ag.), *A. ciliolatum* (Harv.), *A. minus* (Sonder), *Hymenena multipartita* (Hook. f. & Harv.), *H. affinis* (Harv.), *H. Curdieana* (Harv.), *H. valida* (J. Ag.), *H. Berggreniana* (J. Ag.), *H. dialbida* (J. Ag.), *H. Harveyana* (J. Ag.), *H. Fryeana* (Farl.), *H. cryptoneuron* (Mont.), *H. Durvillei* (Bory), *H. lacinata* (Hook. f. & Harv.), *H. venosa* (L.), *H. polyglossum* (J. Ag.), *H. palmata* (Harv.), *H. flabelligera* (J. Ag.), *H. falklandica* n. sp. *Cryptopleura violacea* (J. Ag.), *C. lobulifera* (J. Ag.), *C. crispa* n. sp., *C. endivaefolia* (Hook. f. & Harv.), *C. fimbriata* (Grev.), *C. stenoglossum* (J. Ag.), *C. Ruprechtiana* (J. Ag.).—Special studies which were made of the thallus structure and development, and of the origin and development of the reproductive organs are described and figured for the following: *Hemineura frondosa; Brachyglossum Woodii, B. crispatulum; Hypoglossum Woodwardii; Bartoniella crenata; Phitymorpha imbricata, P. linearis; Chauvinia coriifolia; Botryocarpa prolifera; Membranoptera platyphylla, M. tenuis; Pantoneura plocamioides; Holmesia capensis; Grinnellia americana; Delesseria decipiens; Pseudophycodrys phyllophora; Rhizoglossum thysanorhizans, R. adriaticum, R. reptans;* several species of *Erythroglossum; Polyneura Hilliae, P. latissima, P. Gmelini; Halicnide similans; Heterodoxia denticulata; Heteronema Anderssoniana; Pachyglossum marginiferum; Chondrophyllum monanthos; Ruprechtiella crassifolia, Hypophyllum Middendorfii; Myriogramme minuta, M. denticulata, M. pristoidea; Gonimocolax australis; Polycoryne radiata; Schizoseris laciniata; Nitophyllum punctatum; Acrosorium venulosum, A. uncinatum; Hymenena falklandica; Cryptopleura lacerata, C. lobulifera C., Farlowianum;* and *Gonimophyllum Skottsbergii.* In addition there are given habit-photographs of many less well known species.—The morphology of the thallus and of the reproductive organs is summarized for the groups under the subfamilies, and a key to the genera is given.—*Wm. Randolph Taylor.*

6417. Langeron, Maurice. **Les oscillariees parasites du tube digestif de l'homme et des animaux.** [**Oscillatoriaceae parasitic in the digestive tract of man and animals.**] Ann. Parasitol, Humaine et Comparée **1**: 75–89, 113–123. *10 fig.* 1923.—A critical review of previous literature on this subject with a list of 22 titles is followed by an extended study of *Oscillospira Guillermondi* Chatton & Pérard and a synopsis of the organisms found. The following organisms are described and discussed: *Oscillospira Guillermondi* Chatton & Pérard (*Oscillaria caviae* Simons), *O. batrachorum* (Collin) n. comb. (*Arthromitus batrachorum* Collin), *O. Dubardi* n. sp., *O. Lavieri* n. sp., *O. ingens* n. sp., *Simonsiella* Schmid apud Simons emend. Langeron, *S. Mulleri* Schmid, *S. crassa* Schmid, **Alysiella** n. gen., *A. filiformis* (Schmid) n. comb., **Anabaeniolum** n. gen., *A. Brumpti* n. sp., *A. viscaciae* n. sp., *A. minus* n. sp., *A. intermedium* n. sp., *A. grande* n. sp., and *Oscillatoria intestini* Küchenmeister.—*C. W. Dodge.*

6418. Lemoine, Mme. Paul. **Sur la présence de plages à Lithothamnium à 18 mètres au-dessus du niveau actuel de la mer.** [**Presence of Lithothamnium 18 meters above sea level.**] Bull. Mus. Hist. Nat. [Paris] **29**: 181, 182. 1923.—Foslie has reported the occurrence of Lithothamnia from several localities in Norway, found on the beaches a few meters above high-water mark. *L. Ungeri* Kjellm., *L. tophiforme* Ung., and *L. calcareum* (Pall.) Aresch. are the forms usually represented, with *L. glaciale* Kjellm. from Tamso and Kornes. However, the writer reports *L. soriferum* Kjellm. found in specimens of sand collected 18 meters above sea level on the beaches at Sydvaranger, Norway.—*John M. Fogg, Jr.*

6419. Lindemann, E. **Der Bau der Hülle bei Heterocapsa und Kryptoperidinium foliaceum (Stein) n. nom., zugleich eine vorläufige Mitteilung.** [**The structure of the integument of Heterocapsa and Kryptoperidinium.**] Mez, Bot. Archiv **5**: 114–129. *Fig. 1–20.* 1924.—

The integument of *Heterocapsa triquetra* has parallel plates. *Heterocapsa* is the only peridinean which occurs with and without an apex. Kryptoperidinium n. gen. has cross furrows which are well developed and longitudinal furrows usually well developed. The skin-like integument never becomes armor-like as in *Peridinium*. Plate arrangement is constant and of few elements.—*Carl Mez (transl. by William Seifriz).*

6420. Lindemann, E. **Neubeobachtungen an den Winterperidineen des Golfes von Neapel.** [The winter Peridineae of the Gulf of Naples.] Mez, Bot. Archiv 9: 95–102. *Fig. 1–19.* 1925.—The species found are enumerated together with 1 new species, *Peridinium marinum.—William Seifriz.*

6421. Lindemann, E. **Peridineen aus dem Goldenen Horn und dem Bosphorus.** [Peridineae from the Golden Horn and the Bosphorus.] Mez, Bot. Archiv 5: 216–233. *98 fig.* 1924.—The following numbers of species from each of the following genera are enumerated and described: *Hemidinium* (1), *Glenodinium* (3), *Porocentrum* (2), *Dinophysis* (6), *Phalacroma* (1), *Heterocapsa* (2), *Protoceratium* (1), *Gonyaulax* (4) including *G. orientalis* n. sp., *Goniodoma lacustris* n. sp., *Diplosalis* (1), *Peridinium* (14) including *P. polymorphum* n. sp., *Pyrophacus* (1), and *Ceratium* (5).—*Carl Mez (transl. by William Seifriz).*

6422. Lindemann, E. **Peridineen des Alpenrandgebietes.** [Peridineae of the Alps.] Mez, Bot. Archiv 8: 297–303. *Fig. 1–13.* 1924.—The author enumerates and describes the Peridineae of the Lake of Constance.—*William Seifriz.*

6423. Mann, Albert. **Continuation of investigations and preparations for publication of results of work on Diatomaceae.** Carnegie Inst. Washington Year Book 23: 229–230. 1924.—This progress report mentions fossil diatom material from near Spokane, Washington, as yielding a number of species new to America.—*Wm. Randolph Taylor.*

6424. Phillips, W. J. **Food supply and deterioration of trout in the thermal lakes area, North Island.** Trans. and Proc. New Zealand Inst. 55: 381–391. 1924.—The algae found in the stomachs of the fish included *Nitella, Cladophora, Ulothrix* and diatoms.—*Wm. Randolph Taylor.*

6425. Schmidt, A. **Atlas der Diatomaceen-Kunde.** [Atlas of Diatomaceae.] Issued by Friedrich Hustedt. Heft 88, 89. *Pl. 349–356.* [*Pl. 353–356 dated 1922.*] 1922, 1924.—Illustrations are given of many forms including the following new species and varieties described elsewhere: *Nitzschia plana* vars. *americana* and *fennica; N. abbreviata; N. fonticola* var. *pelagica; N. Hustedti* Debes; *N. amoena; N. gladiformis; N. holsatica; N. subregula; N. angustissima;* Cymbellonitzschia n. g., *C. minima; Surirella subrobusta; S. spiraloides; S. sparsipunctata* var. *levis; S. latecostata; S. gradifera; S. lanceolula; S. Reichelti; S. vasta; S. margaritifera; S. aculeata; S. Heideni; S. Muelleri* n. nom.; *S. acuminata; S. Fülleborni* var. *tumida; S. subcontorta;* and *S. Debesi.—Wm. Randolph Taylor.*

6426. Sjöstedt, L. Gunnar. **Till fragan om Sargassohavets ursprung och biologie. Genmäle till Professor Ö. Winge.** [Origin and biology of the Sargasso Sea. Reply to Prof. Ö. Winge.] (See this issue, Entries 6334, 6335.) Bot. Notiser 1924: 291–298. 1924.—In reply to Winge, Sjöstedt makes the following statements: (1) Winge himself has had no personal contact with the Sargasso Sea; (2) he has not refuted any of the "common theories" regarding periodicity in the Sargasso Sea, and the question of fertile Sargassum there; (3) he has sidetracked the principal argument, namely, the identity of floating and attached forms; (4) Yendo's observations on the similarity between Japanese and Atlantic Sargassum are upheld by other writers; (5) that the periodicity must be due to high temperature is without proof; (6) other algae often form colonies similar to Sargassum; (7) specimens from Greenland merely show how far ocean currents are able to carry the gulfweed; (8) material may come both from the American and African coasts; (9) loss of thallus, etc., must cut down ability to obtain nourishment; and (10) Winge's drift bottle data is insufficient.—*H. K. Svenson.*

6427. Smith, Gilbert M. **Phytoplankton of the inland lakes of Wisconsin. Part II Desmidiaceae.** Wisconsin Geol. & Nat. Hist. Surv. Bull. 57. Part II. *36 pl.* 1924.—This is a continuation of the report on the plankton flora of Wisconsin, a description of the plankton algae, exclusive of the Desmidiaceae and Bacillarieae, having been given in Part I. (See Bot. Absts. 8, Entry 1254.) New species described are *Staurastrum breviaculeatum, S.*

spiculiferum, *S. Bullardii*, *S. contortum*, and *S. urinator*. New varieties are: *Pleurotaenium Trochiscum* var. *tuberculatum*, *Xanthidium armatum* var. *mediolaeve*, *Staurastrum brevispinum* var. *tumidum*, *S. subgrande* var. *minor*, *S. aristiferum* var. *indentatum*, *S. curvatum* var. *elongatum*, *S. pseudopelagicum* var. *tumidum*, *S anatinum* var. *denticulatum*, *S. Johnsonii* var. *depauperatum*, *S. subnudibrachiatum* var. *incisum*, *S. inconspicuum* var. *planctonicum*, *S. ankyroides* var. *pentacladum*, *S. limneticum* var. *cornutum S. tohopekaligense* var. *brevispinum* nom. nov., *Arthrodesmus subulatus* var. *Nordstedtii*, and *A. incus* var. *praelongus*. A new form is *Staurastum fureigerum* var. *armigerum* f. *gracillimum*. The new combinations listed are *Cosmocladium Hitchcockii* (Wolle) (*Dictyocystis Hitchcockii* (Wolle) Lagerheim), *Xanthidium subhastiferum* var. *Johnsonii* (W. & G. S. West), *Staurastrum Chaetoceras* (Schröder), (*Straurastrum polymorphum* Meyen (?) var. *chaetoceras* Schröder), *Arthrodesmus Ralfsii* var. *Brebissonii* (Racib.), and *Arthrodesmus triangularis* var. *rotundatus* (Racib.)—*E. L. Fisk.*

6428. Steinecke, F. **Die Algen des Betula-nana-Moors bei Neu-Linum.** [The algae of the Betula-nana-moors near Neu-Linum.] Mez, Bot. Archiv 5: 339–344. *3 fig.* 1924.—The micro-flora on glacial relics of this moor is relatively poor. *Cosmarium Conwentzii* and *Coelastrum conglomeratum* are described as new.—*Carl Mez* (*transl. by William Seifriz*).

6429. Steinecke, F. **Zur Kenntnis von Chlorochytrium Archerianum Heiron.** Mez, Bot. Archiv 5: 471–472. *1 fig.* 1924.—The author describes this alga which is endophytic in Sphagnum leaves.—*William Seifriz.*

6430. Steinecke, F. **Zygosporie der Zygophyceen als terrestrische Anpassung.** [Zygospory of Zygophyceae viewed as a terrestrial adaptation.] Mez, Bot. Archiv 8: 36–39. *4 fig.* 1924.—The ease with which a large number of Zygnemales, especially those with terrestrial habitat, form rhizoids in response to contact stimulus, and the marked morphological correlation of rhizoid formation with copulation processes, permits one to regard rhizoid formation as a precursor of copulation, and further to regard copulation among the Zygnemales as a habit acquired through terrestrial life.—*Carl Mez* (*transl. by William Seifriz.*)

6431. Strøm, K. M. **Algological notes v–ix.** Nyt Mag. Naturvidensk. 61: 127–136. *1 fig.* 1923.—(v) *Aphanocapsa Koordersi* n. sp. A new species of *Aphanocapsa* from the plankton of a Javanese lake is described and several algae from Java are enumerated. (vi) Sulphur algae from Hungary. (vii) The Alga-flora of Lunz (Austria). These floras are dealt with and the factors controlling the distribution of algae on limestone formations are discussed. (viii) Algae from the English Lake district. (ix) Algae from Sylene. The question of certain blue-green algae being parasitic in the cells of Spagnum is discussed and denied, for the death of the Sphagna is due to other causes and the Myxophyceae only find suitable growing places among them. An additional list of algae from Sylene National Park is given, *Hapalosiphon intricatus* f. *major* n. f. being described.—*Author.*

6432. Taylor, G. R. **Winter treatment of algal growths.** Water Works Issue, Engineering and Contracting 63: 123–124. 1925.—Copper sulphate was used to kill *Dinobryon* and *Synura* in a 850,000,000 gallon reservoir at Carbondale, Pennsylvania, in February. The copper sulphate was introduced in solution through holes in the ice at the rate of 3½ pounds per million gallons at a total cost of $385.00. Objectionable odors and tastes disappeared and no organisms were found until the ice broke up, when a temporary recurrence was noted. Treatment in late fall is suggested to keep new ice from including within itself algal forms.—*H. B. Foote.* (*From Public Health Engineering Absts.*)

6433. Taylor, Wm. Randolph. **Report on the marine algae of the Dry Tortugas.** Carnegie Inst. Washington Year Book 23: 206–207. 1924.—This preliminary report outlines observations conducted during June–July, 1924, at Dry Torgugas, Florida. About 230 algae were found, exclusive of diatoms and dinoflagellates. In shallow protected water, Caulerpas, Valonias, Halimedas, Acanthophora and Laurencias were the most important types. In open water at about 5 fathoms, Dictyotae were dominant, followed by beds of other Caulerpae at deeper levels to 30 or 60 fathoms. Rhodophyceae do not appear to replace the Chlorophyceae in deep water. The marine phanerogams, *Halophila Baillonis* and *H. Engelmanni*, were found, the former in fruit.—*Author.*

6434. Winge, Ö. **Nogle bemaerkninger i anledning af L. G. Sjöstedt's betragtninger**

over Sargassohavet. [Some remarks concerning L. G. Sjöstedt's explanation of the Sargasso Sea.] Bot. Notiser 1924: 284–290. 1924.—Sjöstedt is criticized for studying the question by means of herbarium specimens, instead of embarking for the Sargasso Sea. Winge based his work on determination of boundaries, biology and origin of floating forms, and results of drift bottles, and did not concern himself greatly with nomenclature. Sjöstedt's citation of specimens from the neighborhood of Greenland is derided. The coastal forms of floating Sargassum can be decided only experimental means, and Winge agrees with Børgesen that "the gulf weed is a true pelagic alga." (See this issue, Entry 6426.)—*H. K. Svenson.*

6435. Winge, O. **The Sargasso Sea, its boundaries and vegetation.** Rept. Danish Oceanogra. Exped. 1908–1910. No. 7, 3^2: 1–34. *17 fig.* 1923.—The extent of the Sargasso Sea east of 60° W. Long. has been accurately determined. The northern boundary moves north during the summer but the southern boundary is fairly stationary. Sargassum is present in 3 common types over the whole area, propagating vegetatively with an optimum in autumn and late summer. Less common are 5 other species supposed to be identical with coastal forms. The species are designated by numbers, not names. Ascophyllum is also found floating. Sargassum requires a temperature above 18°C. to thrive and so cannot reach the coast of Europe or the Mediterranean alive as drift.—In addition there is described as new the fungus *Phyllachorella oceanica* Ferd. & Winge. on Sargassum. (See this issue, Entry 6426.)—*Wm. Randolph Taylor.*

6436. Woloszynska, Jadwiga. O t. zw. "niciach śluzowatych" u Gymnodinium fuscum. [The so-called "slime threads" in Gymnodinium fuscum.] Acta Soc. Bot. Poloniae 2: 208–211. *Pl. 4.* 1924.—The slime-threads exuded by *Gymnodinium fuscum*, which quickly swell in water to a broad, colorless mucous sheath, have the form of tough mucous rods but a few microns long when in a saturated solution of sodium chloride. These mucous rods are radially oriented in the protoplast with the thicker end directed outwards. The cell ejects these slime rods forcibly. In water and dilute sodium chloride they at once become slimy and increase their dimensions to long thick filaments. The osmotic pressure of *G. fuscum* appears to be important.—*From German summary.—Wm. Randolph Taylor.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See in this issue Entry 6206)

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*
J. E. Flynn, *Assistant Editor*

(See also in this issue Entries 6120, 6170, 6171, 6174, 6185, 6202, 6314, 6435, 6500, 6502, 6507, 6509, 6535, 6541, 6542, 6545, 6579, 6582, 6592, 6631, 6657, 6658)

FUNGI

6437. Bachmann, E. **Das Lager von Bactrospora dryina (Ach.) Mass.** [The subiculum of Bactrospora dryina Ach. Mass.] Ber. Deutsch. Bot. Ges. 41: 100–102. 1923.—*Bactrospora dryina* flourishes best under the bark in the cork tissue of the oak. Here the hyphae are rich in content and the gonidia abundant and vigorous. In the black bark parenchyma its development is generally poor and superficial.—*Hally Jolivette Sax.*

6438. Bose, S. R. **Les Polyporacées du Bengale.** [Polyporaceae from Bengal.] Rev. Path. Vég. et Entomol. Agric. 11: 134. 1924.—The relative geographical distribution and the relation of the West Indian and Australian forms to those of Bengal is emphasized. Growth of *Polyporaceae* in the Sundaribans region may be inhibited during the rainy season by excess

of water excluding the air from the submerged soils or plant parts, but for fruiting, rains are necessary.—*J. Dufrenoy.*

6439. Chaudhuri, H. **A description of Colletotrichum biologicum, nov. sp., and observations on the occurrence of a saltation in the species.** Ann. Bot. 38: 735–743. *Pl. 1.* 1924.—*Colletotrichum biologicum* was collected in Germany in October, 1921, from the dying stalks of potatoes. The cultural characteristics were studied on different media, under various environmental conditions. After 4 months in the laboratory (16 generations) it suddenly produced a new strain with colored mycelium bearing not only the large concentrically arranged sclerotia of the parent form, but also small sclerotia in radiating lines. The saltation is permanent and keeps its characteristics on Coon's medium in agar, and on oatmeal agar. When grown on potato agar it soon loses completely its distinctive characteristics and becomes the same as the original. The loss is permanent, for when put back to oatmeal agar or Coon's medium, it fails to show the characteristics of the saltant. The production of different colors by the saltant has been found to be entirely dependent on temperature.—*M. Newton.*

6440. Cunningham, G. H. **The Uredinales or rust fungi of New Zealand. Supplement to Part I and Part II.** Trans. and Proc. New Zealand Inst. 55: 1–58. *Pl. 1–2, fig. 77–127.* 1924.—New species described are as follows: *Puccinia Foyana, P. namua, P. whakatipu, P. Anisotominis, P. Euphrasiana, P. Wahlenbergiae, P. Celmisiae, Phragmidium Acaenae, P. novae-zeylandiae, P. subsimile, Milesina Histopteridis, Aecidium kowhai, A. Milleri, A. myopori, A. hupiro, A. Celmisiae discoloris, A. Celmisiae-petiolatae, A. Celmisiae-Petriei, A. macrodontae, Uredo Crinitae, U. karetu, U. toetae, U. Phormii, U. southlandicus, U. tupare, U. wharanii.*—*Wm. Randolph Taylor.*

6441. Cunningham, G. H. **Second supplement to the Uredinales of New Zealand.** Trans. and Proc. New Zealand Inst. 55: 392–396. *Fig. 128–130.* 1924.—New plants described are *Uromyces Edwardsae, Puccinia heketara* and *Uredo Forsterae.*—*Wm. Randolph Taylor.*

6442. Cunningham, G. H. **A revision of the New Zealand Nidulariales or Bird's Nest fungi.** Trans. and Proc. New Zealand Inst. 55: 59–66. *Pl. 3–4.* 1924.—A general description of the character and development of these forms is given, and 8 species are listed with keys and descriptions.—*Wm. Randolph Taylor.*

6443. Cunningham, G. H. **The Ustilagineae or smuts of New Zealand.** Trans. and Proc. New Zealand Inst. 55: 397–433. *Pl. 41–47, fig. 1–30.* 1924.—A general description of the morphology, reproduction, cytology and taxonomy of the group is given with keys to genera and species.—New plants described are: *Elateromyces endotrichus* (Berk.) n. comb., *E. niger* n. sp., *Cintractia sclerotiformis* (Cooke and Massee) n. comb., *Sorosporium Neillii.*—*Wm. Randolph Taylor.*

6444. Davis, J. J. **Notes on parasitic fungi in Wisconsin. IX.** Trans. Wisconsin Acad. Sci. 21: 251–269. *4 fig.* 1924.—Notes pertaining to fungi collected during the season of 1920 in Wisconsin include descriptions of *Ramularia tenuis* n. sp. on *Solidago latifolia,* and *Entyloma linariae* Schroet. var. *gratiolae* n. var. on *Gratiola virginiana.* Notes on distribution and frequency of certain species in the state are added, based on collections and field observations extending over a series of years.—*E. L. Fisk.*

6445. Davis, J. J. **Notes on parasitic fungi in Wisconsin. X.** Trans. Wisconsin Acad. Sci. 21: 271–286. *2 fig.* 1924.—Lists of fungi collected in Wisconsin during the season of 1921 include descriptions of the following new species: *Synchytrium cinnamomeum* on *Ranunculus septentrionalis, S. nigrescens* on *Aster lateriflorus, Macrophoma arens* on *Koeleria cristata, Asteromella astericola* on *Aster lateriflorus, Stagonospora albescens* on *Carex tribuloides, Septogloeum querceum* on *Quercus bicolor,* and *Cercospora molluginis* on *Mollugo verticillata.* Four new combinations are noted: *Ascochyta necans, Cercosporella celtidis* (*Ramularia celtidis* E. & K.), and *Plasmopara illinoensis.*—*E. L. Fisk.*

6446. Davis, J. J. **Notes on parasitic fungi in Wisconsin. XI.** Trans. Wisconsin Acad. Sci. 21: 287–302. *2 fig.* 1924.—Additional data on fungi collected by the writer in Wisconsin in 1922 are given. New species described are: *Tuberculina argillacea* on *Rubus, Phyllosticta ambrosiae* on *Ambrosia trifida, Septoria cenchrina* on *Cenchrus carotinianus, Gloesporium egenum* on *Salix lucida, Colletotrichum violarum* on *Viola scabriuscula, Septogloeum subnudum* on *Smilax herbacea, Cladosporium caducum* on *Betula nigra, Cercospora crassoides* on *Froe-*

lichia floridana, Puccinia caricis-shepherdiae on *Rumex altissimus*. New varieties noted are: *Synchytrium cellulare* var. *lycopodis* on *Lycopus, Septoria bromi* var. *elymina* on *Elymus virginicus, Uromyces perigynius* var. *altiporulus* on *Carex Grayii*. An index covering lists IX, X, and XI is appended.—*E. L. Fisk.*

6447. Grelet, L. J. **Petite étude sur le genre Gloeopeziza et description d'une espèce nouvelle.** [Gloeopeziza and a new species of the genus.] Bull. Trimest. Soc. Mycol. France 40: 224–226. *Fig. 1.* 1924.—*G. Crozalsi* n. sp. found on *Calypogeia ericetorum* in Southern France, differs from *G. Rehmi* in its larger ascospores (15–20 × 8–11 μ).—*J. Dufrenoy.*

6448. Grigoraki, L. **Les Champignons parasites du Syndrome de Beurmann et Gougerot et l'Espèce Rhinocladium Gougeroti.** [Some pathogenic fungi of the genus Rhinocladium.] Bull. Trimest. Soc. Mycol. France 40: 272–276. *Fig. 1.* 1924.—The fungus hitherto known as *Rhinocladium Gougeroti* is described to form yeast-like cells and sterile hyphal threads, but no conidiophores. Therefore it is concluded that its name should be changed to *Dematium Gougeroti.*—*J. Dufrenoy.*

6449. Hanna, W. F. **The dry-needle method of making monosporous cultures of Hymenomycetes and other fungi.** Ann. Bot. 38: 791–795. *2 fig.* 1924.—A dry-needle method of making monosporous cultures of Hymenomycetes and other fungi is described. The method is simple, rapid and extremely precise. Relatively to the poured-plate method, when it is necessary to make numerous cultures, it effects a considerable saving of time and energy and gives results.—*M. Newton.*

6450. Höhnel, Franz. **Fragmente zur Mykologie. XXV. Mitteilung (Nr. 1215 bis 1225).** [Mycological notes.] Sitzungsber. Akad. Wiss. Wien [Math. Nat. Kl.] Abt. 1. 132: 89–118. 1924.—(1215) The allantoid spored forms: The presence of a vacuole at both ends of typical allantoid spores is held to indicate a condition of incomplete division into 2 cells, which in some forms becomes complete. Failure to recognize the allantoid nature of these 2-celled spores has led to a multiplication of generic names for such forms. The differences in stromatic development associated with bark-inhabiting as compared with wood-inhabiting specimens also have obscured their intimate relationship. Thus the genera *Eutypa* Tul., *Cladosphaeria* Nitschke, *Eudoxyla* Fuckel, *Eutypopsis* Karsten, *Endoxylina* Rommel, *Cryptosphaerina* Lamb & Fautr., and *Cryptosphaeria* Grev. are held to be imperfectly separable; except *Eutypa* they are probably identical. The synonymy of *Eutypa eunomioides* (Otth.) Höhn. is given. Other closely related or identical forms are *Anthostoma Ontariense* Ell. & Ev., *Ceratostoma crassicollis*, and probably *Sphaeria Orni.*—(1216) The genera *Herpotrichia* Fuckel and *Enchnosphaeria* Fuckel: These are distinct, the former being dothidiaceous, the latter sphaeriaceous. However, *Herpotrichia callimorpha* (Auersw.) Wint. belongs to *Enchnosphaeria*, but is distinct from *E. Pinetorum* Fuckel.—(1217) The genus *Clypeosphaeria* Fuckel: The author has previously placed *Clypeosphaeria Notarisii* (the type species) among the allantoid spored forms, as closely related to and perhaps identical with *Cryptosphaeria*. A number of other species referred to this genus do not possess allantoid spores, and their position is doubtful. The relationship of the 2 genera is further shown in the discovery that certain species referred to *Kalmusia* are only the wood-inhabiting forms (*Eutypa*) forms of *Clypeosphaeria* species. The type species of *Kalmusia, K. Ebuli*, is not of this character.—(1218) *Camarops hypoxyloides:* The descriptions of this fungus and of *Diatrypeopsis laccata* Speg. are closely similar. The latter is a compound form consisting of *Xenothecium jodophilum* Höhn. inhabiting the empty perithecia of a (*Nummularia?*) stroma. The form identified by Engelke as *Nummularia lutea* was found to be actually *C. hypoxyloides* and is redescribed. *Solenoplea microspora* Starb. is generically identical but specifically distinct. The same applies to *Bolinia tubulina* A. & S. *Bolinia* is given priority over *Camarops.*—(1219) *Vestergrenia nervisequia* Rehm: This is reported as a synonym of *Guignardiella* to which preference is given because it expresses the relationship to the Phyllachoraceae. It is described.—(1220) *Stomatogene Agaves* (E. & Ev.) Theissen: A new description of this fungus and its peculiar manner of growth from the stomata of *Agave atrovirens* is given, which differs in important respects from Theissen's original account.—(1221) *Cenangium Abietis* (P.) Rehm, *C. acicolum* (Fuck.) Rehm and the genus *Cenangium* Fries: *C. Abietis* and *C. acicolum* have been regarded as habitat forms of perhaps the same fungus. On the basis of favorable material, differences of generic rank are now

reported, the former belonging with the Tryblidiaceae, whereas *C. acicolum* is a true Cenangium in the sense of Rehm. Fries (1849) listed 12 species, all but one of which, *C. ferruginosum*, have since been placed in other genera, leaving *Cenangium* restricted to this one Tryblidiaceous form. The species referred to *Cenangium* by Rehm are combined in his section *Encoelia* which is raised to generic rank.—(1222) *Dermatella* Karsten and *Cenangella* Sacc.: *Cenangella Fraxini* (Tul.) Sacc. is believed to be similar to and probably identical with *Dermatea* (*Dermatella*) *Fraxini* (Tul.) Höhn. *Cenangella Rhododendri* (Ces.) R. is a *Dermatella*. *Beloniella Vossii*, is considered a habitat form of *Dermatella*, but if given generic rank should be *Belonopeziza*. *Cenangium Raineri* is a small-spored form of *D. Vossii*, its differentiation having rested on an error in spore measurements. *Belonidium melatephroides* R. is identical with *Pyrenoperziza glabrata* Sacc., both of which should yield to *D. glabrata*.—(1223) The genus *Belonidium:* This was founded on *B. aeruginosum* which is imperfectly known. Of 7 species originally referred to it, 5 have been transferred to other genera. *B. griseo-vitellinum* (Fuck.) R. belongs to *Tapesina*, which is redescribed. *Chalara Rubi* Sacc. & Briard is a secondary spore form. Several species previously referred to *Belonidium* form a homogeneous group differing from the generic type; these correspond to Rehm's treatment of *Belonium*, but this name is pre-empted; they are placed in **Leptobelonium** which is described. Other related species are re-allocated.—(1224) The genus *Pseudohelotium* Fuckel: Similarities between *Peziza pineti* Batsch, here referred to *Helotium*, and *Coronellaria pulicaris* are pointed out, but no change is made; *Peziza ramealis* Karst. is transferred to *Pseudohelotium*.—(1225) *Arachnopeziza* and *Eriopezia: A. delicatula* and *A. aurata* are placed as species of *Gorgoniceps*. *Eriopezia* is based on 2 different types.—*F. Weiss.*

6451. Holttum, R. E. **Observations on the expansion of Dictyophora indusiata Desv.** Gard. Bull. Straits Settlements 3: 281–283. 1924.—A description is given of the process of expansion of this species, as observed in 3 specimens at Singapore. The total time of expansion, from the 1st rupture of the egg to complete unfolding of the veil, was about 70 minutes; the initial extension of the stipe to a length of 10 cm. occupied only about 15 seconds.—*R. E. Holttum.*

6452. Neuhoff, W. **Zytologie und systematische Stellung der Auriculariaceen und Tremellaceen.** [Cytology and systematic position of the Auriculariaceae and Tremellaceae.] Mez, Bot. Archiv. 8: 250–297. *8 pl., 7 fig.* 1924.—The Auriculariaceae and Tremellaceae belong to the Heterobasidiales. The essential structure of this series is the heterobasidium which consists of a hypobasidium and one or more epibasidia. Nuclear fusion takes place in the former. Further characters of the Heterobasidiales are the formation of secondary spores in the germination of the basidiospores, and abundant accessory fruit forms. The formation of septa usually occurs only in one part of the basidium, in the epibasidium of the Auriculariales, Uredinales, and Ustilaginales, in the hypobasidium of the Coleosporiaceae, and Tremellaceae. The Heterobasidiales probably arose from Corticiaceae in which the hypobasidium already existed.—*Carl Mez (transl. by William Seifriz).*

6453. Orskov, J. **Investigations into the morphology of the ray fungi.** *171 p. 64 fig.* Levin & Munksgaard: Copenhagen. 1923.—Utilizing a new method of microscopical examination by which the development of individual growths on agar was observed under a high power dry lens the various types of branching microorganisms included under the ray fungi were studied anew and distinctive modes of development discovered. To the high degree of normal polymorphism exhibited by these fungi are attributed reports of the occurrence of "involution forms." Three main groups of the microorganisms are recognized: Group I consisting of sporogenic fungi, the spores growing into a unicellular mycelium from which arises an aerial mycelium that divides by a breaking-up of the protoplasm into regular-sized parts, the latter being separated from one another by constriction of the thread membrane between the individual elements; Group II, consisting of 2 subgroups, (a) fungi forming initially undivided mycelium with early development of aerial hyphae, both submerged and aerial mycelia dividing spontaneously into segments and (b) fungi that partly grow into true mycelia later dividing into segments, and partly develop by forming rows of segments or distinct individuals, frequently in marked angular arrangement. *Streptothrix chalceae* forming a unicellular delicate branching mycelium at the extreme tip of which oval spores are

produced singly, is set up as the type of Group III. To obviate nomenclatorial confusion, the author suggests the terms *Cohnistreptothrix*, *Actinomyces* and *Micromonospora* for the 3 groups respectively.—*Charles Dreschsler.*

6454. Ota, Masao. Cinq levures du genre Debaryomyces considerées comme pathogènes. [Five yeasts of the genus Debaryomyces thought to be pathogenic.] Ann. Parasitol. Humaine et Comparée 1: 124–136. *5 fig.* 1923.—*Atelosaccharomyces Hudeloi* de Beurmann & Gougerot is transferred to *Debaryomyces* and the following described as new: *D. Leopoldi*, *V. Lundsgaardi*, *D. Laedegaardi*, and *D. Hildegaardi*.—*C. W. Dodge.*

6455. Ota, Masao. Sur une nouvelle espèce d'Aspergillus pathogène: Aspergillus Jeanselmei n. sp. [A new pathogenic species of Aspergillus.] Ann. Parasitol. Humaine et Comparée 1: 137–146. 1923.—This organism was isolated from a case of onychyomycosis and proved pathogenic for the usual laboratory animals. Characters of both *Aspergillus* and *Sterigmatocystis* were combined and no perithecia were produced.—*Author.*

6456. Patouillard, N. Contribution à l'étude des champignons de l'Annam. [Mushrooms from Annam (French Indo China).] Bull. Mus. Hist. Nat. [Paris] 29: 332–339. 1923. —About 135 species of Basidiomycetes are listed from the province of Nhatrang, Annam, the following being described as new: *Grammothele simplex*, *Podoscypha radicata*, *Melanopus umbrino-fuscus*, *Spongipellis Annamiticus*, *Phellinus violascens*, *Xanthochrous opisthopus*, *Hydnum ochroflavum*, *Phylacteria varians*, *Laschia fusco-atra*, and *Lentinus inverse-conicus*.—*John M. Fogg, Jr.*

6457. Wakefield, E. M. Fungi. [In: A systematic account of the plants collected in New Caledonia and the Isle of Pines by Mr. R. H. Compton, M.A., in 1914. Pt. 3. Cryptogams (Hepaticae-Fungi). Jour. Linn. Soc. Bot. London 46: 13–96. *Pl. 2–5, fig. 1.*] *P. 88–93.* 1922.—The fungous flora of New Caledonia resembles that of the tropics of the Old World. There are listed 33 species, 2 of which are described as new: *Clavaria flabellata* and *Encollia neo-caledonica*.—*A. J. Eames.*

6458. Young, P. A. Tabulation of the genera Phoma and Macrophoma. (Abstract.) Phytopathology 15: 47–48. 1925.

LICHENS

6459. du Rietz, G. Einar. Flechtensystematische Studien I. [Notes on taxonomy of lichens.] Bot. Notiser 1922: 210–222. 1922.—The author discusses 4 species of *Xanthoria*, *X. polycarpa*, *X. fallax*, *X. spinosa* and *X. ramulosa*, and 4 species of *Peltigera*, *P. lepidophora*, *P. praetextata*, *P. scutata* and *P. erumpens*. Also *Cladonia subcervicornis* (Wain.) Du Rietz, *C. macrophyllodes*, and *C. verticillata Krempelhuberi* Wein are discussed.—*P. A. Rydberg.*

6460. Lynge, B. Lichens from Spitsbergen. Result. av de norske Statsunderst. Spitsbergenekspeditioner [Kristiania] 1^5: 1–21. *Pl. 1–2.* 1924.—An account of Spitsbergen lichens collected by different travellers is given. The species are systematically enumerated, 123 different species being mentioned.—*K. Münster Strøm.*

6461. Lynge, B. On some South American lichens of the genera Parmelia, Candelaria, Theloschistes and Pyxine. Nyt Mag. Naturvidensk. [Kristiania] 62: 83–97. 1924.—Examination of material from the botanical museums of Upsala, Stockholm and Berlin has resulted in the following new forms or combinations *Parmelia brasiliana* var. *Glaziowii* n. comb., *P. Hieronymi* n. sp., *P. microsticta* var. *riograndensi* n. comb., *P. prolixa* var. *rosea* n. var., *P. soredica* n. sensu, *Candelaria stellata* n. sensu.—*K. Münster Strøm.*

6462. Lynge, B. On South American Anaptychiae and Physciae. Videnskapsselskap. Skrifter I Mat.-Nat. Kl. [Kristiania] 16. *1–47. Pl. 1–5.* 1924 [Oslo 1925].—The present revision is based mainly on collections made by G. A. Malme in the years 1892–1894 and deposited in the Riksmuseet, Stockholm. The species are enumerated with systematic notes on each. The following new forms are described and new combinations or limitations put forward: *Anaptychia hypoleuca* n. sensu, *A. sorediifera* n. comb., *A. esorediata* n. comb., *A. speciosa* n. sensu, *A. leucomelaena* n. sensu, *A. podocarpa* n. sensu, *A. comosa* n. sensu, *Physcia alba* n. sensu, *P. alba* var. *linearis* n. var., var. *obsessa* n. comb., *P. convexa* n. sensu, *P. sorediosa* n. sensu, *P. crispa* var. *hypomela* n. sensu, *P. carassensis* n. sensu, *P. coralloidea* n. sp., *P. adglutinata* n. sensu, *P. syncolla* n. sensu, *P. syncolla* f. *convexa* n. f., *P. minor* n.

sensu, *P. Tuckermannii* n. sp., ad int., *P. picta* n. sensu, *P. aegiliata* n. sensu, *P. aegiliata* f. *coccinea* n. f.—*K. Münster Strøm.*

6463. Smith, A. Lorrain. Lichens. [In: A systematic account of the plants collected in New Caledonia and the Isle of Pines by Mr. R. H. Compton, M. A., in 1914.—Part III. Cryptogams (Hepaticae-Fungi). Jour. Linn. Soc. Bot. London 46: 13-96. *Pl. 2-5, fig. 1.*] *P. 71-87.* 1922.—The lichens of New Caledonia are closely allied to those of Oceania. There are listed 110 species and varieties; of these, 1 genus, Lepidoleptogium, and the following 20 species and varieties are described as new: *Lecidea ferricola; L. Comptonii; Megalospora castanocarpa; Biatorina intermixta* (Nyl.) n. comb., var. *aggregata; B. fusco nigra; Bacidia crocynioides; Buellia glauco-areolata; B. albido-flava; Leprocollema nova-caledonianum, Synechoblastus nematosporus; Lepidoleptogium Montaguei; L. rugulosum; Parmeliella fulva; P. Comptonii; Lobaria subpinnata; Pertusaria velatoides; P. citrina; Placodium griseo-virens; P. cinnamomeum; Rinodina pelolucoides.*—The following new combinations are made: *Leptotrema andamanicum* (*Thelotrema andamanicum* Nyl.); *Leptotrema epitrypum* (*Thelotrema epitrypum* Nyl.); *Biatorina intermixa; Lobaria interversans* (*Ricasolia interversans* Nyl.); and *Parmelia Wainii* (*P. proboscidea* Wainio).—*A. J. Eames.*

BACTERIA

6464. Knudsen, S. Über die Milchsäurebakterien des Sauerteiges und ihre Bedeutung für die Sauerteiggärung. [The lactic acid bacteria in leaven and their importance in fermentation.] K. Vet. og Landbohøjskole Aarsskr. [Copenhagen Agric. Coll. Yearbook.] 1924: 133-186. 1924.—From 30 Danish bakeries and rural households about 200 lactic acid bacteria were isolated. Some of them produce only lactic acid, others acetic acid, carbon dioxide, or alcohol, in this way determining the taste of the bread. Several belong to the last group but those defined as Betabacterium gamma are especially suited for living in the dough. They occur only rarely in flour and should therefore be added to the dough from old dough or pure cultures.—*Ernst Gram.*

6465. Mejlbo, E. Typeinddeling af Mastitisstreptokokker fra Kvæg efter deres Forgæringsforhold. [Classification of Mastitis Streptococci in cattle on the basis of their carbohydrate reactions.] K. Vet. og Landbohøjskole Aarsskr. [Copenhagen Agric. Coll. Yearbook.] 1924: 260-292. 1924.—Of 290 samples of milk from 17 farms supplying Copenhagen, 147 contained mastitis streptococci. The 101 strains cultivated are distributed in 8 groups representing 25 types, but one of the groups contains 47% of the strains. The individual diseased cow as a rule does not yield more than 1 type, whereas a herd may yield as many as 11 types. —*Ernst Gram.*

MYXOMYCETES

6466. Lister, G. Mycetozoa. [In: A systematic account of the plants collected in New Caledonia and the Isle of Pines by Mr. R. H. Compton, M. A., in 1914. Pt. 3. Cryptogams (Hepaticae-Fungi). Jour. Linn. Soc. Bot. London 46: 13-96. *Pl. 2-5, fig.* 1.] *P. 94-96.* 1922.—Ten species are listed with notes on characters and distribution. "The collection confirms the remarkable constancy of species of the Mycetozoa and gives a further proof of the wide distribution of many of the species." *Dictydiaethalium plumbeum* (Schum.) Rost. var. *enthoxanthum* (Berk.) is described as new.—*A. J. Eames.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

(See also in this issue Entries 6149, 6390)

6467. Abrard, R. Quelques observations sur la géologie de l'île de Lemnos d'après la collection du Dr. Joly. [Some observations on the geology of the Isle of Lemnos.] Bull. Mus. Hist. Nat. [Paris] 28: 200-201. 1922.—The genera *Cedroxylon* and *Pityoxylon* are mentioned as having been recognized in fossil deposits from this region.—*John M. Fogg, Jr.*

6468. Carpentier, A. Remarques sur quelques empreintes végétales du Dévonien et du calcaire Carbonifère du nord de la France ou de la Belgique. [Plant impressions from the Devonian and Lower Carboniferous of France and Belgium.] Ann. Soc. Sci. Bruxelles 44: 237–240. 1925.—The author comments on a species of Halyserites like *H. dechianus* Goeppert from the Anor sandstone of lower Devonian age (Taunusian) and suggests that it might represent a pteridophyte instead of an alga, as has generally been supposed. From the upper Devonian (Famennian) of Belgium he describes an impression associated with *Sphenopteris condrusorum* Crepin, which he thinks might represent the seed of that plant. From the Lower Carboniferous (Dinantian) of northern France he records *Archaeosigillaria vanuxemi* and describes associated cones of Archaeocalamites or Sphenophyllum.—*E. W. Berry.*

6469. Chaney, Ralph W. [Paleo-botanical studies.] Carnegie Inst. Washington Year Book 23: 292–293. 1924.

6470. Edwards, W. N. **On Protopiceoxylon Johnseni (Schroeter), a Mesozoic coniferous wood.** Ann. Bot. 39: 1–7. *Pl. 1, fig. 6.* 1925.—This is a redescription of 3 slides, in the British Museum, of fossil wood from King Charles Land, which were originally described by Schroeter as a fossil Pinus. The wood does not show the features of any existing conifers but combines characters of the Araucarian and Abietinean types.—*E. W. Berry.*

6471. Edwards, W. N. **Report on fossil wood from Somaliland.** Pt. 9 of a Monograph of the Hunterian Museum of Glasgow University, on a collection of fossils and rocks from Somaliland. *1 p.* 1925.—The author records coniferous wood, probably araucarian, from the Jurassic of western Somaliland, and *Nicolia aegyptiaca* Unger from the Cenozoic of Daben, the latter a dicotyledonous wood supposed to belong to the family Sterculiaceae.—*B. W. Berry.*

6472. Fritel, P. H. **Contribution à l'étude des flores tertiairies d'après les matériaux du Muséum national d'Histoire naturelle. IV. Revision de la Flore aquitanienne de Coumi (Grèce). [Contributions to Tertiary floras based on materials in the Museum. IV. Revision of the Aquitanian flora of Coumi, Greece.]** Bull. Mus. Hist. Nat. [Paris] 28: 123–128. 1922.—The following fossil forms are discussed: *Cinnamomum lanceolatum, C. polymorphum,* var. *acuminatum, C. Scheuchzeri, C. subrotundum, Laurus primigenia, L. Lalages, Litsaea magnifica, Baccharites aquensis* var. *brevior, Ziziphus paradisiacus, Bumelia Oreadum, Andromeda narbonensis, Sapindus graecus, Carya Brauni,* and *Leguminosites* sp.—*John M. Fogg, Jr.*

6473. Fritel, P. H. **Contribution à l'étude des flores tertiairies d'après les matériaux du Muséum national d'Histoire naturelle. V. Flore bartonienne des "Grès à Sabalites." [Contributions to Tertiary floras based on materials in the Museum. V. Bartonian flora of the Sabalites sandstone.]** Bull. Mus. Hist. Nat. [Paris] 28: 202–207, 329–332, 385–390, 448–452. 1922.—The first part discusses a series of fossil imprints collected by Saporta, giving special attention to the following: *Aneimia dissociata; Lygodium Kaulfussi; Sabalites andegavensis; S. primaeva; Podocarpus eocenica* var. *haeringiana; Quercus cenomanensis; Q. magnoliaeformis; Q. taeniata;* and *Dryophyllum curticellense.* The second part describes as new *Laurus Forbesi* var. *latior,* and *Persea andegavensis.* It contains information concerning *Apocynophyllum neriifolium, Myrsine formosa, Nerium sarthacense* and *Diospyros senescens.* The third part discusses the following species from the region of Saint-Pavace and Sargé: *Andromeda lauriforma* Saporta; *A. dermatophylla* Saporta; *Sterculia Labrusca* Unger; *Celastrus buxiformis* Saporta mss.; *C. inquinatus* Saporta mss.; *Apeidopsis decaisneana* Crié; *Sabalites suessionensis* (Watelet) Fritel; *Palmacites* sp., *Leguminosites* aff. *leptolobiifolius* Marty; *L. andiroides* Nob.; *L. (Gleditschites) Brongiarti* (Watelet) Fritel.—The fourth part discusses: *Cheilanthes andegavensis* Crié: *Flabellaria milletiana* Crié; *Myrica lignitum* (Unger) Saporta; *M. andegavensis* Crié; *M. exilis* Saporta; *Ficus milletiana* Crié; *F. pachyneura* Boulay; *Laurus primigenia* Unger; *Daphnogene patulinervis* Boulay; and *Apocynophyllum ligerinum* Boulay. A list is included to show which fossil species are common to the various geological strata in this part of France.—*John M. Fogg, Jr.*

6474. Fritel, P. H. **Contribution à l'étude des flores tertiairies d'après les matériaux du Muséum national d'Histoire naturelle. VI. Flore sparnacienne du "grès des lignites" des environs de Laon et de Soissons (Aisne). [Contributions to Tertiary floras based on materials in the Museum. VI. Sparnacian flora of the lignitic sandstone of Laon and Soissons.]** Bull.

Mus. Hist. Nat. [Paris] 29: 189–193. 1923.—The author corrects and augments Watelet's list of fossil plants from this region to include the following: *Posidonia parisiensis, Dryophyllum curticellense, Comptonia Michelotti, Quercites basilicensis, Alnites basilicensis, Dewalquea* aff. *gelindennensis, Diospyros axonensis, Viburnum dubium, Lomatia obovata, Leguminosites leptolobiifolius.—John M. Fogg, Jr.*

6475. Fritel, P. H. **Présence du genre Lygodium Swartz dans les meulières aquitaniennes de Beauce.** [Lygodium in the Aquitanian of Beauce.] Bull. Mus. Hist. Nat. [Paris] 29: 240–341. 1923.—Fragments of fronds of *Lygodium*, a genus hitherto unreported from the Aquitanian of the Paris Basin, collected from the millstone quarries of Vauboyen, near Jouy-en-Josas, Seine-et-Oise, France, are referred to *L. Kaulfussi* Heer. Impressions of rhizomes from the same locality are believed to represent *Arundo Donax*, concerning the involved synonymy of which the author presents a discussion.—*John M. Fogg, Jr.*

6476. Fritel, P. H. **Sur la présence d'Osmunda regalis L. à l'état fossile dans les tufs Pléistocènes de la Celle-sur-Seine.** (Seine-et-Marne). [Osmunda regalis from the Pleistocene tufas of Celle-sur-Seine, (France).] Bull. Mus. Hist. Nat [Paris] 29: 122. 1923.—The author reports this fern which has not been previously collected or known from the Pleistocene formations of this region.—*John M. Fogg, Jr.*

6477. Fritel, P. H. **Variations du type foliaire chez les Cinnamomum des argiles aquitaniennes de Marseille.** [Variations in Cinnamomum from the aquitanian clays of Marseille.] Bull. Mus Hist. Nat. [Paris] 29: 270–273.—Of 9 species of *Cinnamomum* from the Aquitanian (for which a key is given) only 5 have been found in the clays at Marseille, namely, *C. lanceolatum, C. polymorphum, C. Buchi, C. spectablie*, and *C. transversum.* Of these *C. polymorphum* displays the widest range of variation, 4 varieties having been distinguished by Saporta, These varieties grade insensibly with one another and with *C. Buchi* and *C. spectabile.* The author divides the material studied into groups on the basis of 4 main characters, and finds that the transition from one group to another is made gradually, and forms a continuous cycle which passes through the extreme types like *C. Buchi, C. transversum*, and *C. spectabile* leading back to the normal type, *C. polymorphum.* The conclusion drawn is that all such foliar forms, no matter where collected may be referred to a single, specific type: *C. polymorphum.—John M. Fogg, Jr.*

6478. Gothan, W., and P. Schlosser. **Neue Funde von Pflanzen der älteren Steinkohlenzeit (Kulm) auf dem Kossberge bei Plauen im Vogtland.** [New occurrence of Lower Carboniferous plants in the Kossberg near Plauen in Saxony.] *13 p. 6 pl.* Weg: Leipzig, 1924.—This paper records various Archaeopterideae such as *Triphyllopteris, Sphenopteridium, Cardiopteris*, and *Rhacopteris.* Calathiops is considered to represent the fertile shoot of some member of this tribe and the new species *C. schlosseri* is described, as well as *Conites Feilitzschianus*, which is considered to be a lepidodendroid cone.—*E. W. Berry.*

6479. Hirmer, M. **Die fossilen Pflanzen Ägyptens: D. Filicales.** [The fossil plants of Egypt: Filicales.] Abhandl. Bayer. Akad. Wiss. 30^3: 1–18. *Pl. 1–5, fig. 1.* 1925.—This is a continuation of the descriptions of fossil plants collected in Egypt by Stromer. The plants described in the present contribution are impressions from the Lower Cretaceous, which are identified as *Weichselia reticulata* Stokes & Webb, and a petrified stem from the Cenomanian of the Baharije Oasis which is considered to be a new species of Osmundites, *O. (?) stromeri*, the anatomy of which is discussed in detail.—*E. W. Berry.*

6480. Hirmer, Max. **Zur Kenntnis von Cycadopteris Zigno.** [Cycadopteris Zigno.] Palaeontol. 66: 127–164. *Pl. 9–12. fig. 27.* 1924.—The author has made a critical study of the various Jurassic and Lower Cretaceous forms that have been referred to the genera *Cycadopteris* Zigno and *Lomatopteris* Schimper. He concludes that all of these represent the same generic type and should be referred to *Cycadopteris*, which has priority. They are considered to be distinct from the genus *Thinnfeldia* with which there has been a tendency to confuse them. The 19 nominal species that have been described are considered to be referable to the 2 species *Cycadopteris Brauniana* Zigno and *Cycadopteris jurensis* (Schimper), which would hence range from the Lias to the Lower Cretaceous, the 1st in the Alpine, and the 2nd in the non-Alpine region of Europe.—*E. W. Berry.*

6481. Hollick, Arthur. **A review of the fossil flora of the West Indies with descriptions**

of new species. Bull. New York Bot. Gard. 12: 259–324. *Pl. 1–15.* 1924.—The author presents a historical review mentioning Antigua, St. Bartholomew, Anguilla, Martinique, Curacao, Porto Rico, Hispaniola, Jamaica and Cuba, and describes the following: from the Tertiary of Hispaniola, *Palmocarpon acrocomioides, Ficus domingensis, F. pseudonitida, Ficus* sp., *Coccoloba* (?) sp., *Dalbergia gabbi, Swietenia* sp., and *Apocynophyllum* sp., all new; from the Tertiary of Porto Rico, *Palmophyllum* sp., *Anona saraviana* (?), *Aniba portoricensis, Laurophyllum dubiosum, Inga pseudonobilis, Inga* sp., *Pithecolobium pseudotrapezifolium* and *P. vexativum, Cassia* (?) *dubiosa, Sophora* (?) *suspecta, Sapindus obesus, Myrcia eugenioides, Psidium* sp., *Icacorea prisca, Stylogyne* (?) *fragmenta, Plumeiera evidens, Hancornia pseudopubescens* and *H. minor, Aspidosperma collazoense* and *Apocynophyllum pseudowillughbya;* from the Tertiary of Trinidad, *Palmocarpon bactrioides, Musophyllum trinitense, Ficus porcellanaria, pseudoeggersi* and *comparabilis, Coussapoa vaningeni, Ocotea pseudomartinicensis, Inga pseudonobilis, Cassia sipariensis, Clusia vera, Myrcia pseudorostrata, Eugenia comparabilis, Geissanthus brittoni, Plumiera alia, Cameraria* (?) *incerta,* and *Crescentia cucurbitinoides;* from the late Tertiary or Pleistocene of Cuba, *Musophyllum* sp., *Ficus pseudoeggersii, Coccoloba simulans, Nectandra pseudoantillana, Ilex pseudocassine* and *I. pseudomyrtifolia, Zizyphus* sp., *Samyda matanzensis, Bumelia reclinatafolia, Mimusops leonii* and *M. jumuriensis,* and *Bignonia sensibilis.—E. W. Berry.*

6482. Kräusel, R. **Archaeoxylon Krasseri, ein Pflanzenrest aus dem böhmischen Präkambrium.** [Archaeoxylon Krasseri, a plant from the PreCambrian of Bohemia.] Naturwiss. Zeitg. Lotos. 72: 31–37. *Pl. 2.* 1924.—The author describes as **Archaeoxylon** *Krasseri* n. gen. & n. sp., poorly preserved structural material from the PreCambrian of Mratin near Jungbunzlau. This shows tracheids with rounded pits and may represent a primitive member of the Psilophytales. It is compared with *Hostimella* and *Pseudosporochnus* from the Devonian of Bohemia.—*E. W. Berry.*

6483. Kräusel, R. **Beiträge zur Kenntnis der fossilen Flora Südamerikas I. Fossile Hölzer aus Patagonien und Benachbarten Gebieten.** [Contributions to the Fossil Flora of South America I. Fossil wood from Patagonia and vicinity.] Arkiv Bot. 19^9: 1–36. *Pl. 1–4.* 1924.—The following are described: An ericaceous or myrtaceous wood from the Pleistocene of the Island of Peluque, Chile; *Dadoxylon pseudoparenchymatosum* Gothan, *Dadoxylon* sp. *Podocarpoxylon Dusenii* n. sp., *Phyllocladoxylon antarcticum* Gothan, *Phyllocladoxylon* sp., *Cupressinoxylon* sp., *Nothofagoxylon scalariforme* Gothan, *Nothofagoxylon* sp., and *Laurinoxylon uniradiatum* Gothan from various localities and horizons in the Tertiary of Patagonia and Chile. From Tierra del Fuego, *Dadoxylon pseudoparenchymatosum. Phyllocladoxylon antarcticum* and *Nothofagoxylon* sp., are recorded. Interesting as possibly bearing on former geography are the facts that the Dadoxylon is also found on Seymour Island, Kerguelen Island and in New Zealand, and the Phyllocladoxylon is found on Seymour Island.—*E. W. Berry,*

6484. Kräusel, R., and G. Schönfeld. **Fossile Hölzer aus der Braunkohle von Süd-Limburg.** [Fossil wood in the brown coal of South Limburg.] Abhandl. Senckenbergisch. Naturf. Ges. 38^3: 253–289. *Pl. 1, fig. 26.* 1924.—The author describes the following woods from the Tertiary of southern Linburg: *Juniperoxylon silesiacum* (Prill) Kräusel, *Pinuxylon* sp., *Laurinoxylon nectandrioides* n. sp., *Cornoxylon latiporosum* n. sp., and *Cornoxylon* sp.—*E. W. Berry.*

6485. Kräusel, R., and E. Stromer. **Ergebnisse der Forschungsreisen Prof. E. Stromers in den Wüsten Ägyptens IV. Die fossilen Floren Agyptens.** [Results of Stromer's explorations in the Egyptian Desert IV. The Fossil Flora of Egypt.] Abhandl. Bayer. Akad. Wiss. 30^2: 1–48. *Pl. 3, fig. 21.* 1924.—After a summary of previous work and a bibliography, the authors discuss the following: 5 algae comprising 2 species of Ovulites from the Eocene, a Lithothamnium from the Cretaceous, a Dactylopora from the Eocene and a Chara (?) from the Pleistocene. Three gymnosperms comprise Araucaria wood and *Cupressinoxylon* (?) sp. from the Cretaceous, and *Dadoxylon mokattamensis* n. sp. from the lower Oligocene. *Teichosperma spadiciflorum* Renner is considered to represent a pandanaceous fruit intermediate between the genera *Pandanus* and *Freycinetia.* A petrified rhizome from the Pleistocene of the Fayum is described and referred to *Cyperus papyrus* L. Nipadites fruits are recorded from

the middle Eocene, a Palmacites is recorded from the Upper Cretaceous, and 5 varieties of palm (*Palmoxylon*) stems are recorded including a new variety, *stromeri* from the Cretaceous. —*E. W. Berry.*

6486. Lipps, Th. Ueber die Unter-Kreide-Flora Nordwest-Deutschlands, besonders die Flora des Barrémien von Hildesheim. [The Lower Cretaceous flora of Northwest Germany.] Mez, Bot. Archiv 4: 329–381. *Fig. 1–42.* 1924.—The following forms have been described: *Matonium Göppertii* (the genera *Matonium* and *Matonia* are compared), *Laccopteris Dunkeri, Hausmannia Kohlmanni, Weichselia* (presumed to stand between Cyatheaceae and Gleicheniaceae), *Gleichenia* cf. *longipennis, Sagenopteris neocomensis, S. Mantelli, Zamiophyllum Buchianum, Dioonites Dunkerianus, Otozamites* cf. *Hoheneggeri, Podozamites* cf. *affinis, P. vallisnerioides* n. sp., *P. longifolius* n. sp. *Baiera* (?) *Salfeldi, Desmiophyllum* sp., cf. *Eolirium primigenium, Widdringtonia Reichii, Frenelopsis Hoheneggeri, Brachyphyllum* cf. *obesum,* cf. *Cyparissidium gracile, Sequoa* sp., cf. *Sphenolepidium Sternbergianum, S.* cf. *fastigiata, S.* cf. *delicatula, Cylindrites spongioides* (regarded as belonging to the same epoch as the Cycadophyten diminutive flora), *Feistmantellia Goppertii, Williamsonia* cf. *interfracta, Bennettitteae* fructifications, *Cycadeae* fructifications, Fructification incertae sedis perhaps belonging to the Ranales of the dicotyledons. Surprisingly close relationships of this Barrémien flora with the lower Jura and even with the upper Trias exist. Although such close relationship with succeeding forms does not exist owing to the absence of Angiosperms, yet there does exist a connection with the present flora and especially with the Sequoias. Annual rings in the fossil forms give evidence of climatic changes.—*Carl Mez (transl. by William Seifriz).*

6487. Lämmermayr, Ludwig. Die Entwicklung der Buchenassoziation seit dem Tertiär. Eine pflanzengeographische Studie. [Evolution of the beech association since the Tertiary.] Repertorium Spec. Nov. Regni Veg. Beihefte 24. *1–100. 7 maps.* Berlin-Dahlem, 1923.—The general deterioration of the climate in late Tertiary time led to leaf-fall, sand-formation and other adaptations by the beech. During the Pleistocene glaciations the beech in Eurasia was driven south of the 50th parallel, that is to southern France and northern Spain, to Italy, the Balkan Peninsula, the Carpathians, northern Asia Minor, and Caucasia. When the last ice sheet disappeared the beech spread northward. Withdrawal southward, and migration northward must have accompanied each one of the 3-4 glaciations. though this is not discussed by the author. The late-Quaternary northward migration proceeded quite slowly, the beech being one of the last trees to reach Sweden. where it arrived in subboreal time or about 4,000 years ago (=Mya time). The northern limit of distribution lies about on the 60th parallel. Of the present limits of distribution only the eastern one, in southwestern Russia and in Poland, (and perhaps the western one in England and northwestern Spain) is purely climatologic. The southern limit is partly determined by adaphic conditions. The northern limit and perhaps also the western is historic, expansion being possible on these fronts. The distribution of the fossil and recent genera *Fagus* and *Nothofagus* agrees well with the teachings of Simroth's pendulation theory. There are no associated plants exclusively characteristic for the beech forests. The associated plants differ with time and place. Middle-European, Eurasian, Eurosiberian, circumpolar, and more seldom Illyric (pertaining to the countries on the east coast of the Adriatic Sea) floral elements with great range of light requirements, low maximum and minimum, and with dorsiventral leaves prefer the deeply shady interior of the beech forests; while Atlantic, Mediterranean, Alpine, and Pontic (pertaining to the region of the Black Sea) forms with narrower range of light requirements, high maximum and not too low minimum, are to be found at the edges of the forests.—The Baltic, and probably also the Alpine, floral elements associated themselves with the beech already in the Tertiary. The Atlantic, Mediterranean, and Illyric elements were added during the confinement to southern Europe, during the glaciations; and the Pontic elements were essentially introduced in late-Quaternary time.—*Ernst Antevs.*

6488. Mathiesen, Fr. J. Pityoxylon gillinghamense, a new species of coniferous wood from southeastern England. Meddel. Dansk Geol. Foren. 6: 1–15. *Fig. 6.* 1924.—The author describes the structure of this new species found in the English Cretaceous at Gillingham, Kent. The anatomy is very like *Pinus* but shows both Abietinean and Araucarian types of tracheal pitting.—*E. W. Berry.*

6489. Pia, Julius. Die Siphoneae Verticillatae vom Karbon bis zur Kreide. [The Siphoneae-Verticillatae from the Carboniferous to the Cretaceous.] Abhandl. Zool.-Bot. Ges. Wien 11^2: 1–263. *8 pl., 27 fig.* 1920.—Part 1 is a systematic analysis of the species known. The material is described and restorations are figures as well as the actual fossils. The following genera are discussed: *Vermiporella*, Anthracoporeaia n. gen., *Mizza* from the Carboniferous; *Macroporella, Gyroporella, Teutloporella, Oligoporella, Physoporella, Diplopora, Griphoporella,* from the Triassic; *Actinoporella, Triploporella, Goniolina, Linoporella,* Palaeocladus n. gen., *Petrascula, Coniopora,* Sestrosphaera n. gen., *Griphoporella* of the Jurassic; *Munieria, Salpingoporella, Triploporella, Neomeris* from the Cretaceous.—The following new species are described: *Anthracoporella spectabilis, Macroporella perforatissima, Gyroporella maxima, Oligoporella duplicata, Physoporella praealpina, Diplopora phanerospora, Diplopora annulatissima, Diplopora clacaeformis; Diplopora praecursor, Diplopora uniserialis, Palaeocladus mediterraneus, Sestrophaera liasina, Griphoporella undulata.*—The following new combinations are proposed: *Vermiporella vclebitana* (Schub), *Mizzia yabei* (Karp.), *Macroporella Beneckei* (Sal.), *Teutloporella aequalis* (Gümb.), *T. herculea* (Stopp), *T. vicentina* (Tornqi), *T. nodosa* (Schafh.), *T. triasina* (Schaur), *P. hysoporella pauciforata* (Gümb.), *P. dissita* (Gümb.), *P. minutula* (Gümb.), *Griphoporella curvata* (Gümb.), *G. gümbeli* (Sal.), *Triploporella remesi* (Steinm.), *Goniolina geometrica* (Rœm.), *Linoporella capriotica* (Oppenh.), *Petrascula bursiformis* (Ett.), *Petrascula* (?) *globosa* (Alth.), *Coniopora subtilis* (Steinm.), *Salpingoporella mühlbergii* (Lor.).—The 2nd section of the paper deals with the theoretical considerations involved in the structure and branching of the axis, reproductive organs, skeleton. distribution, and phylogeny. The following tribes are accepted: Cyclobrineae, with sub tribes Cyclocrininae and Mastoporinae; Primicorallineae; Dasyporelleae; Teutloporelleae; Diploporeae, with sub-tribes Macroporellinae and Diploporinae; Triploporelleae, with subtribes Triploporellinae and Petrasculiae; Conioporeae; Dasycladeae; Neomereae; Acetabularieae.—An especially complete bibliography is appended.—*Wm. Randolph Taylor.*

6490. Price, George McCready. **The phantom of organic evolution.** *219 p.* Fleming H. Revell company: New York, Chicago [etc.], 1924.

6491. Retterer, Édouard. **Éléments d'histologie; structure et évolution de la matiere vivante. . . . .** [Elements of the histology, structure and evolution of living matter. . . . .] *2* + [7] + *219 p. Illus.* Payot: Paris, 1924.

6492. Scott, D. H. **The early geological history of the seed plants.** School Nature Study Union Publ. 57: 1–4. 1925.—This is a popular account of the Devonian and Carboniferous seed bearing plants.—*E. W. Berry.*

6493. Streitz, Karl. **Kritik der Theorien über die Entstehung der Hochgebrigspflanzen.** [A critique of the theories on the origin of alpine plants.] Mez, Bot. Archiv 8: 405–449. 1924. —Many fossil finds in lowlands support the idea that some present alpine species may have entered the alpine regions in an already adaptive form at the time of the Ice age. Such forms could have developed their adaptive alpine habitus from other than alpine factors, for example, the arctic and xerophytic steppe forms. The complete absence of fossils in alpine regions leaves the descent relationships of the endemic mountain species in doubt. Geological and climatic factors suggest that the ancestral forms of alpine species were members of a migrated subtropical tertiary flora. The time of origin of the alpine flora was, probably, the beginning of the Tertiary, so that the larger part of the alpine types were already present at the beginning of the Ice age.—*William Seifriz.*

6494. Walton, J. **On Rhexoxylon Bancroft, a Triassic genus exhibiting a liane-type of vascular organization.** Phil. Trans. Roy. Soc. London B212: 79–109. *Pl. 2, fig. 4.* 1923.—The author describes Triassic stems with liane-like structure from South Africa and Antarctica. *Rhexoxylon tetrapteridoides* is new, *R, africanum* Bancroft is re-described, and *R. priestleyi* is based upon material from Antarctica originally referred by Seward to *Antarcticoxylon.* Arguments are advanced for considering these anomalous stems to be related to *Dadoxylon* rather than to the Medullosae, as was formerly supposed.—*E. W. Berry.*

6495. Wieland, G. R. [Paleo-botanical studies on the cycadeoids.] Carnegie Inst. Washington Year Book 23: 296–298. 1924.

6496. Wirbar, G. Nachweis von Zellulose in Form von gut erhatenen Baumwoll- und

Leinenfasern (wie Samenhaare von Gossypium und Bastzellen von Linum) in deutscher Braunkohle. [Proof of cellulose in the form of cotton and linen threads (like the seed hairs of Gossypium and the bast cells of Linum) in the German brown coal (Miocene).] Braunkohle 22: 788–793. *Fig. 3.* 1924.

6497. Ziegenspeck, H. Der serologische Stammbaum des Pflanzenreiches und die Phytopalaeonotologie. [A serological family tree of the plant kingdom.] Mez, Bot. Archiv 9: 37–49. *2 pl.* 1925.—Two detailed phylogenetic trees are given, one depicting the relationship of all present and known past plant families, and the other showing the geologic time of origin of the chief plant families from Devonian to Tertiary times.—*William Seifriz.*

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash and Harry Braun, *Associate Editors*

(See also in this issue Entries 6036, 6040, 6045, 6052, 6055, 6061, 6068, 6079, 6098, 6099, 6104, 6109, 6112, 6138, 6142, 6167, 6171, 6174, 6198, 6199, 6202, 6235, 6237, 6238, 6250, 6252, 6262, 6264, 6275, 6328, 6340, 6341, 6344, 6347, 6351, 6380, 6386, 6417, 6444, 6445, 6446, 6447, 6448, 6449, 6600, 6640, 6657, 6658, 6671, 6784)

DISEASES CAUSED BY FUNGI

6498. Anonymous. **Smuts of wheat.** Ministry Agric. Egypt. Mycol. Div. Bot. Sect. Leaflet 5. *1–5. Pl. 1–6.* 1924.—Bunt (*Tilletia tritici* and *T. levis*), loose smut (*Ustilago tritici*), and flag smut (*Urocystis tritici*) are briefly discussed relative to symptoms, mode of infection and treatment.—*Frederick V. Rand.*

6499. Anonymous. **The smuts of millet.** Ministry Agric. Egypt. Mycol. Div. Bot. Sect. Leaflet 6. *1–4. Pl. 1–5.* 1924.—Long smut (*Tolyposporium filiferum*), grain smut (*Sphacelotheca sorghi*) and head smut (*Ustilago reiliana*) are briefly discussed as to symptoms, treatment and, in the last 2 cases, mode of infection.—*Frederick V. Rand.*

6500. Atanasoff, D. **The Dilophospora disease of cereals.** Phytopathology 15: 11–40. *Fig. 1–9.* 1925.—The disease of cereals and of certain grasses, produced by *Dilophospora alopecuri* (Fr.) Fr., has been known in Europe for nearly a century. Recently several workers have noted the association of this disease with infection by the nematode, *Tylenchus tritici.* The observation by the author that this association was constant, in that *Dilaphospora* was never found on plants free from the nematode infestation, led to the present investigation of the life history and parasitism of the fungus, the nature of its association with the nematode, and the disease symptoms produced by each organism. The symptoms of Tylenchus infection are not noticeable until the 3rd or 4th leaf of the young plant appears. Thereafter, infected plants may be distinguished by the decided wrinkling and rolling of the upper leaves, and the pronounced swelling of the leaf bases. The leaves are shorter and wider and their sheaths are broader, swollen with hypertrophied mesophyl tissue, brittle, and stand loosely around the inner leaves. Some of the plants die soon after these symptoms appear, but others continue to grow and produce dwarf, distorted heads filled with nematode galls instead of normal grain. The Dilaphospora symptoms also appear first on the 3rd or 4th leaf, before it emerges, as tiny pale spots which soon enlarge, becoming more or less elongated. A black dot, consisting of one or more pycnidia, soon appears in the center of each spot. As pycnidia continue to form, the spots often appear as black streaks bordered by healthy green tissue or by lines of pale yellow tissue. The leaf sheaths and the tips of the young leaves become firmly bound together by the mycelium so that the new growth can not emerge normally. The young leaves and the culm curl up inside and may finally break out through the side of the diseased sheath. The head may be entirely destroyed and never appear, or it may break through, partly destroyed by the fungus and partly filled with nematode galls or even with normal grain. The infected portion of the head, at first grayish, soon becomes black and covered with pycnidia, resembling superficially a fungous sclerotium. The pycnospores are cylindrical with a clump of 3–6 or more hair-like bristles at either end. Upon germination these spores

form only short hyphae and numerous secondary spores. When the fungous spores come in contact with a Tylenchus larva they become firmly attached to it by means of the spore bristles and are carried by it between the leaf sheaths of the young plant to a point near the growing apex. Here they germinate and parasitize the young leaves weakened by the feeding of the larvae. All attempts to infect Tylenchus-free plants by injecting Dilaphospora spores into the growing point have failed. Apparently the fungus is able to parasitize only plants weakened by Tylenchus infestation; therefore control of the nematode disease will effectively prevent damage by *Dilophospora*. A discussion of the morphology and taxonomy of the fungus is also given.—*B. B. Higgins.*

6501. Barger, William F. **Treating oranges with borax solution for control of blue and green mold.** California Citrograph 10: 149. *Fig. 1–2.* 1925.—This is a report of experiments conducted under commercial conditions by investigators of the U. S. A. Dept. of Agric. in cooperation with the Field Dept. of the California Fruit Growers Exchange to determine the effect of borax treatments in controlling the common blue and green (Penicillium) molds on Valencia oranges. Over 13,000 injured and inoculated fruit were used in these tests. Fruit inoculated and then soaked for 6 minutes in 9, 8, 4 and 2½% solutions of borax at 110°F. showed only 3 to 31% decay after 6 weeks, while similar fruit soaked in water at the same temperature showed 100% decay by the end of the 1st week. Fruit soaked in a 4% borax solution at 69°F. showed heavier decay when the solution was heated to 110°F. Experimental shipping tests were made to eastern markets and 30 carloads of borax-treated fruit were shipped in the regular commercial movement from 1 packing house. These shipments gave results supporting the laboratory tests and it is concluded that there seems to be no question but that these molds can be controlled on oranges by soaking them in 7% borax solutions at 110°F. for 5 minutes.—*C. S. Pomeroy.*

6502. Braun, Harry. **Geranium stemrot caused by Pythium complectens n. sp.—Host resistance reactions. Significance of Pythium type of sporangial germination.** Jour. Agric. Res. 29: 399–419. *5 pl., 3 fig.* 1924.—*Pythium complectens* causes a progressive basal blackening and soft rot of geranium cuttings, which stops at a sharp line of demarcation, 20–40 mm. from the base, within 6–8 days after inoculation. Stoppage of infection is specific for this host and pathogen, and is due to a host resistance reaction manifested by the formation of a cork cambium completely across and within the stem, barring further progress of the hyphae after infection has proceeded some distance from the point of inoculation. It is accompanied by disappearance of starch from healthy cells in the vicinity of the cambium. Coleus cuttings are completely rotted down when inoculated with this fungus.—Cultural characters on 16 media and temperature relations of the fungus are described.—The smooth oospores lie free within the smooth terminal oogonia. Antheridia are particularly characteristic, flaring out into a trumpet form or a broad, lobed mass, clasping and fused with a large part of the oogonial surface. No fertilization tube has been observed; fertilization takes place through a hole in the fused oogonial and antheridial walls by direct passage of antheridial contents into the immediately subjacent oosphere. The exospore wall is formed by the peripheral extension of a narrow clear disk within and around the smooth oosphere, a process not heretofore described in this genus.—A theory of the significance of the Pythium type of sporangial germination is proposed and discussed from the standpoint of adaptation. Comparison of this type of zoospore formation with that in other genera points (1) to the greater intrinsic efficiency of the former type in view of the advantages herein discussed, resulting from emergence of the undifferentiated contents *en masse*, and the fragility of the vesicle membrane; and (2) to an interpretation of the Pythium type as an adaptation which secures minimum waste of spore-forming material combined with maximum ease of dissemination—at the expense, however, of protection at a critical stage. That it did not become fixed in derived or related genera, such as *Phytophthora*, is an expression of the general evolutionary tendency toward protection of offspring rather than facility of dissemination.—*Author.*

6503. Briton-Jones, H. R. **A wound parasite of cotton bolls.** Ministry Agric. Egypt Tech. and Sci. Serv. Bull. 19. *1–8. Pl. 1–2 (1 col.).* 1923.—The fungus, *Rhizopus nigricans*, causes a rotting of the cotton boll starting at a wound and spreading rapidly until the whole boll is involved; uninjured bolls are not affected. The disease occurs in both upper and

lower Egypt and increases after the Nile flood.—Infection tests are detailed.—The only means of control is by checking the attacks of the insects which provide points of entry for the fungus.—A thorough investigation of the effect of this boll infection on the life history of the pink boll worm is suggested.—*Frederick V. Rand.*

6504. Briton-Jones, H. R. **The rusts and smuts of wheat, barley and oats.** Ministry Agric. Egypt Tech. & Sci. Serv. Bull. 15. *1-16. Pl. 1-6.* 1920.—The 3 rusts of wheat, caused by *Puccinia graminis, P. glumarum* and *P. triticina* are considered, their life history is given and reference is made as to their special behavior under Egyptian conditions. Besides on wheat, black rust (*P. graminis*) is stated to occur on barley, oats, wild oats (*Avena fatua* L.) and also on the 2 wild grasses, *Lolium perenne* L. and *Hordeum murinum.* Yellow rust (*P. glumarum*) occurs on wheat and barley, while orange rust (*P. triticina*) is said to be confined to wheat.—The results obtained in the U.S.A. as to the incapacity for infection by *P. graminis* from wheat to oats without the parasite passing first through barley, are briefly mentioned. The author states that he carried out no experiment to determine whether the form on wheat can infect other hosts or not; he has, however, observed that neighboring plants of barley and oat crops growing next to badly rusted wheat fields were often free from rust; or at any rate no more attacked, than those within the field.—The different theories put forward to explain the occurrence of rust are given. The ability of the uredospore to live in the soil and bring about infection every year is suggested as the most plausible view at the present time. The author considers temperature and humidity as 2 important factors in determining the date of the appearance of rusts and their subsequent development on their hosts.—According to observations carried out at the Giza Experimental Farm during 1920: Orange rust (*P. triticina*) was observed to attack the Indian, Australian, South African and Tunesian wheats more than the Egyptian varieties. On the former varieties the rust appeared about 98 days after sowing, while on the Egyptian varieties it appeared later and at different dates. The Egyptian varieties are decidedly more susceptible to yellow rust (*P. glumarum*) than any of the other varieties. The appearance of this rust, with 1 exception, was recorded on the 108th day after sowing. Black rust (*P. graminis*) attacks principally the Indian wheats and appeared on this wheat about 100 days after sowing.—The author states that rust attacks have gradually increased in Egypt during the last 10 years. He shows that the attack of yellow or black rust on Egyptian or Indian wheats was observed to be heavy on alternate years. He then suggests that, although this regular alternation of the attack in the 2 kinds of rusts cannot yet be explained, should it continue to occur, it would then become possible to partly control the attack by growing the variety of wheat in the year when the specific rust to which this variety is susceptible is predicted to be light. The most reliable method of controlling rust is by breeding resistant varieties which, to be of true economic value, must be resistant to both the most serious rusts in Egypt, namely, yellow and black rusts. For the present he recommends the following measure: Avoid excessive watering and excessive nitrogenous manuring, and sow early and as evenly as possible.—The author states that so far, in Egypt, loose smut (*Ustilago tritici*) of wheat causes negligible losses, although present in almost every wheat field. He suggests, however, the possibility of its becoming severe, since new varieties susceptible to this disease may be introduced. The life-history of the parasite is given and it is stated that sometimes it is possible to recognize the disease a considerable time before the emergence of the ear by the uppermost leaves becoming split longitudinally and bearing the black spores of the fungus. This is particularly noticed in a susceptible variety named Dakker. As control measures the author suggests the hot water treatment.—Loose smut (*Ustilago nuda*) of barley is said to be of rare occurrence in Egypt; its life-history resembles that of *Ustilago tritici.* The hot water treatment is suggested as a control measure; but, since barley is less resistant to heat, the seed should be immersed in water at 52°C. for 15 minutes instead of at a temperature of 54°C. for 10 minutes as is done with loose-smut-infected wheat.—The life history of covered smut (*Ustilago hordei*) of barley is given and the average loss throughout lower Egypt is estimated at 2%. In certain crops, however, the loss may be as great as 20%. The copper sulphate, potassium sulphide and formalin seed treatments are given as control measures for this disease.—The life history of loose smut (*Ustilago avenae*) of oats, is given. Of the 3 control measures suggested, namely, the hot water, copper sulphate and formalin treatments, the last mentioned is preferred.—*Tewfik Fahmy.*

6505. Christensen, J. J., and E. C. Stakman. **Foot and root rots of wheat in Minnesota in 1924.** (Abstract.) Phytopathology **15**: 53. 1925.

6506. Davis, W. H. **Drop of Chinese cabbage and common cabbage.** (Abstract.) Phytopathology **15**: 50. 1925.—Disease is due to *Sclerotinia sclerotiorum* (Lib.) Massee.—*B. B. Higgins.*

6507. Dietz, S. M. **Alternate hosts of Puccinia coronata Corda.** (Abstract.) Phytopathology **15**: 54. 1925.

6508. Dietz, S. M. **The inheritance of resistance to Puccinia graminis avenae.** (Abstract.) Phytopathology **15**: 54. 1925.

6509. Drechsler, Charles. **A leaf-spot of redtop caused by an apparently undescribed species of Helminthosporium.** (Abstract.) Phytopathology **15**: 51–52. 1925.

6510. Ezekiel, Walter N. **Presence of the European brown-rot fungus in America.** (Abstract) Phytopathology **15**: 55. 1925.—*Sclerotinia cinerea* (Bon.) Schr. is reported from California and Oregon.—*B. B. Higgins.*

6511. Garbowski, Ludwig. **Helminthosporium cucumerinum sp. n., wystepujacy jako szkodnik na ogórkach.** [H. cucumerinum n. sp. injurious to cucumber.] Extrait Bull. Acad. Polonaise Sci. e Lettres. Ser. B: Sci. Nat. **1923**: 15–20. *Pl. 1.* 1923. (Imprimerie de l'Universite: Cracovie, 1924.)—A diseased cucumber plant sent from the Crimea was found to be infected with a new species of *Helminthosporium,* the growth of which on various media and on the host plant is described.—*Lilliam C. Cash.*

6512. Garbowski, Ludwig. **Means adopted in Poland for protection against contagion by black scab of potatoes (Synchytrium endobioticum).** Internat. Rev. Sci. and Pract. Agric. n. s. **2**: 733–736. 1924.—By detection of small centers of infection before the disease has extended to surrounding fields, and by placing these centers under supervision so as to prevent spread of the fungus, black scab has been kept under control in Poland. A list of agencies cooperating under the Phytopathological Service, with their locations, is given.—*Wanda Weniger.*

6513. Hart, Helen. **Factors affecting the development of Melampsora lini (Pers.) Desm.** (Abstract.) Phytopathology **15**: 53–54. 1925.

6514. Hartley, Carl. **Cacao canker in Java.** [Phytophthora faberi?] (Abstract.) Phytopathology **15**: 44. 1925.

6515. Henry, A. W., and E. C. Stakman. **The control of flax rust.** (Abstract.) Phytopathology **15**: 53. 1925.—This paper refers to the control of flax rust (*Melampsora lini* (Pers.) Desm.) by breeding desirable resistant varieties.—*B. B. Higgins.*

6516. Hiura, Makato. **On the flax anthracnose and its causal fungus, Colletotrichum Lini (Westerdijk) Toehinai.** Japanese Jour. Bot. 2^2: 113–132. *Pl. 6, fig. 1–3.* 1924.—The author reviews previous researches and then gives in detail his own, relative to spore formation and germination, cytology, the appressorium, formation of setae and his observations and experiments on the flax plant, including inoculation tests. *Colletotrichum Lini* attacks all parts of the flax plant. On the seedling the damping off and canker stages occur. On the mature plant the fungus generally attacks the lower ½ of the capsule, gradually piercing its tissues and finally infecting the seed. In slightly affected seed, the mycelium lodges in the mucilaginous epidermis only, but in severe infection penetrates all layers of the seed-coat and into the embryo. It was found to hibernate in the seed. Maturing capsules and seed are immune; and when the pigment layer of the seed-coat is completed the fungus can no longer attack endosperm or cotyledon. Wind is the important factor in disseminating the conidia.—Varieties vary in susceptibility. The conidia are as a rule uninucleate. In culture, the mycelium occasionally exhibited numerous nuclei, apparently in pairs.—*Frederick V. Rand.*

6517. Hoffer, G. N., and J. F. Trost. **Influence of balanced nutrient supply on susceptibility of corn plants to Gibberella saubinetii (Mont.) Sacc.** (Abstract.) Phytopathology **15**: 59–60. 1925.

6518. Hubert, Ernest E. **The diagnosis of decay in wood.** Jour. Agric. Res. **29**: 523–567. *Pl. 1–11, fig. 1–6.* 1924.—Methods for a complete diagnosis of the decays commonly found in wood and wood products are presented for the 1st time, involving the study of a representative number of wood-destroying fungi of economic importance. Decay and its

stages in wood are defined and decay processes considered in relation to the study. A classification of wood rots under the 2 main groups of white rots and brown rots and their sub-groups is presented as a workable means of grouping rots according to their gross characters. The brown rots as a class, on the basis of economic losses, appear to be of greater importance than the white rots.—The methods useful in the diagnosis of decay are given under the 3 main divisions of gross, microscopical and cultural characters. These characters when carefully determined are believed to furnish sufficient data for the identification of the causal organism. A comparison of the incipient discolorations and zone lines of various wood rots indicates the value of these gross characters in diagnosis tests. The extent to which hyphae penetrate the wood beyond the discolored area was determined for some fungi by means of microscopical examinations and by cultures. Studies made on the methods of cell wall penetration, size and shape of bore holes, hyphal characters and general pathological effect upon the cell structures have furnished evidence of the value of microscopical characters, as has also a critical study of the manner of penetration of the hyphae of *Trametes pini* in pine wood. Cultural characters are found to be of great value in diagnostic studies, in many cases furnishing the evidence necessary to complete the identification of the fungus decomposing the wood. A method is presented which may be used in checking the association of xylophilous fungi with the rots produced, and the results of experiments are given showing this relationship for certain fungi. A complete diagnosis of a sample of wood will determine whether or not decay is present and whether the causal organism is alive or dead, and will furnish data on the nature of the fungus. It will make the detection of decay in otherwise sound wood easier and, in most cases, the cumulative evidence obtained will lead to the identification of the fungus causing the rot. It is stated that the careful use of the diagnostic methods presented will furnish data of scientific value which can be applied to the solution of numerous problems relating to the staining and rotting of wood and wood products. A list of 92 citations bearing on the work is included.—*Author.*

6519. Humphrey, C. J., and Miles, L. E. **Dry-rot in buildings and stored construction materials and how to combat it.** Alabama Polytechnic Inst. Ext. Serv. Circ. 78. *1–28. Pl. 1–3, fig. 1–13.* 1925.—The organism causing dry-rot (*Poria incrassata*) is described in its different stages, and preventive measures are given.—*Lillian C. Cash.*

6520. Hurt, R. H. **The importance of removal of mummies and affected fruit in apple bitter-rot control.** (Abstract.) Phytopathology **15**: 56. 1925.

6521. Jones, Fred Ruel. **Soil-inhabiting fungi parasitic upon the pea plant and their relation to disease.** (Abstract.) Phytopathology **15**: 59. 1925.—*Aphanomyces euteiches* Drechsler is the most common cause of root-rot in peas.—*B. B. Higgins.*

6522. Keitt, G. W., and L. K. Jones. **Further studies of the seasonal development and control of apple scab and cherry leaf spot.** (Abstract.) Phytopathology **15**: 57–58. 1925.

6523. Kitasima, Kimizô. **Observations on the rotting of the European houses still standing after the earthquake and on the orange-colored fungus developing on the scorched trees.** (Japanese.) Zeitschr. Forstbauuntersuchungen. (Special No.) **1923**: 71–80. *1 pl.* 1923.—After the recent earthquake the author carefully examined the ruins of many houses built in the European style, and was impressed by the fact that in damp regions like Japan, the wooden portions of such houses rot away rapidly. Especially in the case of wood surmounted by brick, the luxuriant growth of dry-rot mycelia was often noticed even when the wooden parts were still only a few years old. The predisposing cause is apparently great dampness combined with high temperature.—A few days after the fire of Sept. 1 there was observed, especially on the burned trees, the development of a beautiful orange-colored fungus, which the author identified as *Monilia aurea* Gmel., although according to the results of pure culture work there is some doubt as to its identity. The fungus in question grows rather deep under the upper surface of the host. The conidial layers, which soon develop, are at first white, then pale yellow and finally orange. The great resistance of the fungus to heat was experimentally studied. After heating ½ hour at 55°C. it develops as rapidly as when unheated; and by heating ½ hour at 65°C. its development was only slightly delayed. On the basis of such observations it seems apparent to the authors that in the fire all fungi were destroyed with the exception of this species, which survived owing to its unusual resistance to heat.—*Author.* (*Courtesy Japanese Jour. Bot.*)

6524. Mains, E. B. Rye resistant to leaf rust, stem rust, and powdery mildew. (Abstract.) Phytopathology 15: 58–59. 1925.

6525. Massachusetts Dept. of Agric. Annual Rept. 1921. *1–145.* 1922.—This includes a description of work on the white pine blister rust for 1921.—*P. J. Anderson.*

6526. Massachusetts Dept. of Agric. Annual Rept. 1922. *1–95.* 1923.—This includes a report of the work of the year 1922 on white pine blister rust.—*P. J. Anderson.*

6527. Meer, Jikke H. H. van der. **De verticilliumziekte van kruidachtige en houtige gewassen.** [Verticillium disease of herbaceous and woody plants.] Tijdschr. Plantenz. 31: 59–74. *8 pl.* 1925.—This is a résumé of the author's monographic work on the same subject, published in English in the Mededeel. Landbouwhoogeschool Wageningen 28². 1925. (See lso Bot. Absts. 13, Entry 5249.)—*D. Atanasoff.*

6528. Oortwijn Botjes, J. **Onderzoek naar de vatbaarheid van aardappelsoorten voor de wratziekte.** [Study of the varietal resistance of potatoes to wart disease.] Verslag. en Mededeel. Plantenziektenk. Dienst Wageningen 40. *1–25.* 1925; Tijdschr. Plantenz. 31: 31–55. 1925.—The following, out of a large number of potato varieties grown for at least 2 years on infected soil, failed to develop the disease: Bloemgraafjes, Gladblaadjes, Lissabonners, Bruine Muizen, Pruisiche roode, Seedling 2649, Ceres, Seedling 1, Energie, Robijn, Commandant, Lieuwe, Fontein, Kruisling, and Trenctria. The varieties slightly susceptible for the disease are: Roodeschoolsche Jam, Alpha, Triumph, Franco, Express, Preferent, Roode Star, and Seedling 815.—*D. Atanasoff.*

6529. Poole, R. F. **Sweet potato varieties that produce well and are resistant to stem rot on sassafras sands.** (Abstract.) Phytopathology 15: 48. 1925.

6530. Poole, R. F. **The relation of soil moisture to the pox disease [Cystospora batatae] of sweet potatoes.** (Abstract.) Phytopathology 15: 48. 1925.

6531. Rodenhiser, H. A., and E. C. Stakman. **The control of loose smuts of wheat and barley, and barley stripe by Uspulun, Semesan, and Germisan.** (Abstract.) Phytopathology 15: 51. 1925.

6532. Rudolph, B. A. **Monilia blossom blight (brown rot) of apricots.** California Agric. Exp. Sta. Bull. 383. *3–55.* 1925.—Monilia blossom blight is due to a species of *Sclerotinia.* The fungus reproduces itself by means of spores produced in abundance before the blossoms open, on the old blighted twigs and decayed fruits left in the trees. A 2nd reproductive form is known but rarely occurs in California. The blossoms may be attacked at any time after the buds have shown the folded white petals beneath the red sepals, and even until the petals have been shed. Having killed a blossom the fungus passes into and kills the twig, later attacking the ripening fruit with production of a characteristic "brown rot." In recent years the disease has become exceedingly destructive in California, possibly due to the planting of less resistant varieties. In already seriously infected orchards where normal climatic conditions render the disease difficult to control, a dormant spray of any standard fungicide may noticeably decrease the amount of disease, but seldom sufficiently to be of practical value. A spray applied in the spring when the buds are expanding, or still later in the red bud stage, affords the best control obtainable with any one treatment. In localities normally damp during the susceptible period and where old infectious material has not been removed from the trees, the control obtained by such a spray may be entirely unsatisfactory, although, relatively speaking, the amount of disease may be much diminished. A spray applied at any time after the blossoms open usually affords some relief, but the practical control afforded is generally a failure; the longer the spray is delayed, the greater the failure is likely to be. Moisture is the great determining factor in the infection of the flowers. Many growers, not recognizing this fact, credit the control of the disease in dry seasons to weak mixtures of standard fungicides or to other spray materials which under more normal conditions prove utterly unsuited to the purpose. In badly diseased orchards situated where the weather is normally humid during the blossoming period, multiple spraying throughout the entire susceptible period is the only means likely to secure a practical control. The degree of control in badly diseased orchards is proportionate to the number of sprays applied during the susceptible period of the blossoms.—Orchard sanitation is as vital as spraying in the control of the disease, but should be regarded only as an auxiliary to spraying operations.—Manures, decaying and freshly cut grasses and alfalfa

in the orchard do not harbor the fungus over winter.—Many ornamental plants were examined, but the disease was found only in the Japanese quince (*Chaenomales japonica*).—The fungicide best adapted to use on apricot trees for control of this disease is home-made Bordeaux mixture, 8–8–50. The 5–5–50 or 6–6–50 formula frequently gives excellent results in orchards less severely affected or in localities where climatic conditions are more favorable to control. Bordeaux mixture does not interfere with the blossom fertilization which apparently takes place before the red buds open. Having brought the disease within the limits of practical control by the multiple spray method, fewer sprays, and in most instances, only 1 spray of 8–8–50 or weaker strength will be needed in succeeding years to hold the disease in check.—Lime-sulphur, soda-sulphur and other sulphur-containing compounds are distinctly unsuited for use on apricots because they induce a physiological injury commonly referred to as "sulphur poisoning." The foliage on such trees is stunted and yellowish, the fruit is dwarfed, of poor color and quality, and ripens late. Even pure sulphur applied with water to the ripening fruit may cause it to be stunted and late in ripening. Apricot trees treated with sulphur or sulphur-containing compounds sometimes fail to bloom the following season.—The more commonly used oil emulsions, miscible oils and coal-tar derivative sprays applied in winter for the control of insect pests, have also some fungicidal effect, but are insufficient for the control of this disease in badly affected orchards in humid localities. Applied in the spring they usually burn the buds or lower the crop yield by interfering with the pollination of the flowers.—Fungicidal dusts were found ineffective, and particularly so in localities where the disease is difficult to control. The results obtained from the dusts were generally very poor from both the relative and practical standpoints.—*A. R. C. Haas.*

6533. Schneiderhan, F. J., and R. H. Hurt. **The dry-mix spray for peaches.** Virginia Agric. Exp. Sta. Bull. 239. *1–16. 2 fig.* 1925.—In experimental spraying extended over 2 seasons the dry-mix gave satisfactory control of scab and brown-rot of peach and proved fully as effective, if not more so, than the self-boiled lime-sulphur in common use. The formula used was identical with that developed at the New Jersey Exp. Sta.: 8 pounds of finely ground sulphur, 4 pounds of hydrated lime and ½ pound of calcium caseinate in 50 gallons of water. Varying quantities were employed in 1 series of tests, and 30 pounds of the dry materials in 200 gallons of water was found to give commercial control equaling the 50 pounds previously employed. Virginia growers are advised to use 32 pounds to 200 gallons of water. A considerable saving was effected in the home-mixing of materials and a simple and satisfactory home-made mixer is described. Commercial growers who have used the dry-mix are well satisfied and it is believed that it will rapidly come into general use for peaches. The advantages of dry-mix are detailed, the principal one being the relative simplicity of preparation.—*F. D. Fromme.*

6534. Schoene, W. J., C. R. Willey, and L. R. Cagle. **Cedar spots and fruit losses.** Quart. Bull. Virginia State Crop Pest Commission, 6[4]: 1–8. 1925.—The relation between severity of infection with cedar rust as measured by the number of infections on apple leaves and losses at harvest was determined for a number of orchards in Virginia in 1924. It appears that orchards in which the average infection does not exceed 2–3 spots per leaf will normally mature the crop. Injury is noticeable when the number exceeds 3, even under favorable conditions for apple production. Serious defoliation and reduction in crop occurs when the number of spots reaches 8–10 per leaf and as many as 20 spots per leaf produce such severe injury that the fruit stops growing when about ⅓ mature.—*F. D. Fromme.*

6535. Spaulding, Perley, and Annie Rathburn-Gravatt. **Longevity of uredospores, teliospores and sporidia of Cronartium ribicola.** (Abstract.) Phytopathology 15: 58. 1925.

6536. Stakman, E. C., E. B. Lambert, and H. H. Flor. **Varietal resistance of spring wheats to Tilletia levis.** Minnesota Studies Plant Sci. (Studies Biol. Sci. 5.) 2: 307–316. 1924.—About 870 spring sown varieties and selections of the different botanical groups of *Triticum* were grown for 2 years, and a smaller number for 5 years, in order to ascertain their comparative resistance to bunt, *Tilletia levis*. In general, the *vulgare* group seems to be susceptible; while the *dicoccum* and *monococcum* groups are resistant. There are great differences, however, in the resistance of different varieties within the larger groups. Marquis and Florence were the most resistant varieties in the *vulgare* group. Some of the hard red spring

wheats, such as Marquis and Preston, are quite resistant; others, such as Kota, Prelude, and Glyndon fife, are very susceptible. In the *durum* group the commonly grown varieties, such as Acme, Mindum, Monad, Kubanka, and Arnautka, are quite resistant. Some wheat varieties having the chromosome number of *vulgare* are highly resistant to *T. levis* while others of the same group are very susceptible. There appears to be no real correlation, therefore, between chromosome number in itself and disease resistance. Additional evidence is presented to show that resistance to diseases usually is specific and not general.—*Authors.*

6537. Stakman, Louise J. **Some fungi causing root and foot rots of cereals.** Minnesota Studies Plant Sci. (Studies Biol. Sci. No. 4) **1**: 139–161. *Pl. 26–28.* 1923.—Sterile seed of Ligowa oats (Minn. 281), spring rye (Minn. 61), Haynes bluestem wheat (Minn. 169), Kubanka durum wheat (C I 4063) and an unnamed variety of durum wheat were grown on sterile carrot agar and potato dextrose agar and the young seedlings were transferred to sterile test tubes or flasks containing Sachs' modified nutrient solution solidified with 1% agar and inoculated with Fungi Imperfecti which had been isolated from the plant parts or from the soil. A few pot-cultures using sterile white sand were also used and they verified the results with the agar solutions. Out of the 24 forms studied 9 were parasitic: *Alternaria* sp., *Botrytis* sp., *Colletotrichum phomoides*, *Gliocladium* sp., *Tilachlidium* sp., and *Trichoderma* sp., were parasitic on the roots, while *Fusarium culmorum*, *Rhizoctonia solani*, and *Sclerotium rolfsii* caused a blighting of the whole seedling. The mycelium in infected roots was confined chiefly, but not entirely, to the cortical and epidermal cells, causing a tendency for these tissues to become disorganized and break off.—*L. O. Regeimbal.*

6538. Thomas, K. M. **Some coffee diseases of South India and their control.** Jour. Madras Agric. Students Union **12**: 250–257. 1924.—Rust caused by *Hemileia vastatrix* was found on stray coffee plants far away from plantations. A species probably identical with this fungus was noticed on 2 Rubiaceous plants, *Vangueria spinosa* and *Randia uliginosa*. The disease is controlled partly by application of nitrogenous manures and partly by spraying with Bordeaux mixture. Kent's Arabica, probably a natural cross between Arabica and Liberica, is more popular owing to its disease resistance and other qualities.—Stomata are smaller in the variety Robusta than in others; and in the guard cells the wax globules are more numerous and fuse much later in the resistant varieties Liberica, Robusta and Kent's Arabica than in the susceptible Arabica or Jackson's hybrid.—"Koleroga" or black-rot (*Pellicularia koleroga*), brown eye-spot (*Cercospora coffiella*), anthracnose (*Colletotrichum coffeanum*), "root disease" and black bean or "Jollu" are other diseases affecting the crop in South India. The last is of recent occurrence, causing much damage; its exact cause is still unknown.—*P. S. Jivanna Rao.*

6539. Tisdale, W. H., and V. F. Tapke. **Infection of barley by Ustilago nuda through seed inoculation.** (Abstract.) Phytopathology **15**: 59. 1925.

6540. Walker, J. C. **Studies on disease resistance in the onion.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 183–189. *1 fig.* 1925.—Three diseases of onions are caused by partially saprophytic fungi which often attack the dead outer scales of the bulbs in the field and then produce gradual decay in storage. The diseases and causal fungi are: smudge (*Colletotrichum circinans* (Berk.) Vogl.), neck rot (*Botrytis alii* Munn and *Botrytis* sp.) and black mold (*Aspergillus niger* van Tieg.). With the first 2 diseases named, yellow and red onions are much less susceptible than white onions to field infection of the dead scales and show much less storage rot; with black mold, on the other hand, no such difference in susceptibility is observed. Tests show that the succulent scales of the white and colored varieties are about equally susceptible to direct inoculation with the fungi of both smudge and neck rot, and that the expressed juice of the white and colored varieties produces no marked differential effect on the growth of any of the 3 fungi. On the other hand, with the first 2 fungi, water extracts of the dead outer scales of red and yellow onions were decidedly toxic to spore germination, while the extract of scales of white onions permitted normal germination; the fungus of black mold grew very well in all 3 extracts. The toxic substance is found only in colored tissue and appears to be related to the flavones which occur in both red and yellow onions.—*Howard B. Frost.*

DISEASES CAUSED BY BACTERIA

6541. Cook, Mel T. **Two new bacterial diseases.** (Abstract.) Phytopathology **15:** 55. 1925.—A vascular infection and wilt of egg-plant and a similar disease of cosmos have been observed.—*B. B. Higgins.*

6542. Day, W. R. **The watermark disease of the cricket-bat willow (Salix caerulea).** Oxford Forest. Mem. 3. *80 p. Fig. 1–17.* 1924.—This disease, appearing as a die-black of the crown, chiefly affecting the larger trees and rendering them almost worthless, has been epidemic within the last few years in the counties of Essex and Hertfordshire, England. The 1st symptom of the disease, which generally appears in May but occasionally up to the end of July, is the general wilting and withering of the leaves on a part of the crown. These withered leaves turn brown and hang on for some time. It generally takes 2 or more years for the disease to kill the tree. When the leaves die, adventitious shoots often develop on the dying branches and on the other parts of the tree; only in the latter case are they still alive the next season. After the leaves die, thin, sticky, colorless exudations of bacteria occur on the dying branches, turning brown on exposure to the air. These exudates always flow from the wood through bark wounds which are usually due to insects (emerging imagos of small hymenopterids). At this time no fungus is associated with the dying branches. The bark of affected branches dies back only gradually, and during the summer it becomes infected with a saprophytic and weakly parasitic fungus, *Cytospora chrysosperma*, which cannot cause the death of a vigorously healthy tree, but which hastens the death of a diseased tree and by autumn or winter has thickly studded the dead bark with its fructifications. Affected wood is dark stained.—A short, rod-like schizomycete, provisionally called *Bacterium salicis* n. sp., which by inoculation experiments has been demonstrated to cause the disease, can always be isolated, often in pure culture, from freshly dying branches. This species is described. It is a strictly vascular parasite, apparently unable to attack and disintegrate parenchyma or woody tissues, is confined to the larger vessels, occurring chiefly in the last year's wood, and so far has not been found in leaves or smaller rootlets. Infection always takes place in the crown, apparently through wounds in the smaller branches made by insects which also may be carriers of the disease. Later, the exudations probably provide a source of infection, but radial spread is very slow.—The dying-back is chiefly due to a stoppage of the water supply; hence, the dying of the leaves takes the form of a general wilt. Later, the sap is poisoned by bacterial by-products and substances from dead parenchyma cells.—Trees growing on sites with wet subsoil are apparently more liable to the disease than on sites where the subsoil is moist but well drained, or even dry. The spread of the disease appears to be favored by too close planting with its resultant partial suppression of the crowns and dense shading of some of the branches.—*Ferdinand W. Haasis.*

6543. Elliott, Charlotte. **A bacterial leafspot of Martynia.** Jour. Agric. Res. **29:** 483–490. *Pl. 1–3.* 1924.—Plants of *Martynia louisiana* showing bacterial lesions on the leaves were collected from beet fields in Kansas. A white bacterium was isolated which reproduced the disease on Martynia but was not infectious to sugar beets, cucumber plants or trumpet creepers. When severe, the disease may infect the fruit and even destroy the entire plant. A detailed description is given of the cultural, morphological, and physiological characters of the organism which is named *Bacterium martyniae* n. sp. Sanitary measures and the use of seed from disease-free pods are recommended for control of the disease.—*Author.*

6544. Hartley, Carl. **Varietal tests of peanut (Arachis hypogaea) for wilt [Bacterium solanacearum] resistance.** (Abstract.) Phytopathology **15:** 55. 1925.

6545. McCulloch, Lucia. **A leaf and corm disease of gladioli caused by Bacterium marginatum.** Jour. Agric. Res. **29:** 159–177. *Pl. 1–5, fig. 1.* 1924.—(See also Science **54:** 115–116.) This disease is widely distributed in the U. S. A. It has been found on gladioli grown in California, Florida, Pennsylvania, Virginia, Maryland, Ohio, Michigan and Indiana. Many, probably all, varieties are attacked, young stock being less subject to attack than old stock. In general it is not a rapidly developing disease and under average conditions causes only slight or moderate damage. With increased heat and moisture its effects are more serious.—Infection is often confined to a few inconspicuous, rusty-red spots on the lower part of the 1st leaf. In more severe cases large areas of tissue are destroyed in 1 or all of the

leaves and the upper parts of the leaves die from lack of nourishment. The disease is known to some growers as "neck-rot." The corms are disfigured by circular, shallow depressions, small in size (2–6 mm. diameter) but often numerous and coalescing. The husks have circular, to elongated spots, dark in color. The bacteria responsible for these lesions on leaves, husks and corms of gladioli, have been isolated repeatedly and infections secured on healthy plants. Virulent bacteria have been isolated from corm lesions after 9 months in storage. There is also evidence that the bacteria remain alive and virulent in the soil for at least 1 year.—The causal bacterium is considered to be an undescribed species and is named *Bacterium marginatum* n. sp. because of the characteristic margin that forms about plate colonies.—*Author.*

6546. Magrou, J. **Le cancer des plantes.** [Cancer of plants.] Rev. Scientifique 63²: 33-43. *12 fig.* 1925.—A review of the subject of plant tumors is given, based largely upon the work of Erwin F. Smith. The author presents data which indicate that light has a marked influence on the growth of cancer in mice. Inoculated mice placed in the dark developed 1.6% infection as compared to 9% for those left in the light. When the light conditions were reversed for the same mice, those which had been changed from light to darkness dropped to 4% infection, while those changed from darkness to light increased to 14% infection. The author then suggests that since cancerous tissue is rich in potassium, it is quite possible that the rays from radioactive substances, such as potassium, may stimulate the abnormal growth which occurs in cancerous tissue.—The similarity between human cancer and plant cancer is shown by certain experimental results (Blumenthal, Auler, and Meyer). These workers obtained from several human cancers a bacterium closely resembling *Bacterium tumefaciens*. Sunflowers inoculated with this organism gave characteristic tumors. From these results the conclusion is then drawn that if *Bacterium tumefaciens* does not play an important part in human cancer, the work is at least suggestive.—*A. E. Hitchcock.*

6547. Maruda Rajan, D. **A new remedy for the potato ring disease.** Jour. Madras Agric. Students Union 12: 281–284. 1924.—"Potatoes affected by ring disease germinated normally after being subject to the dry heat treatment" (53°C.).—*P. S. Jivanna Rao.*

6548. Picado, C. **Une maladie des haricots. (Association bactérienne parasitaire d'espèces antagonistes en vie libre.)** [A disease of beans. (Parasitic association of bacteria which are antagonistic as saprophytes.).] Rev. Path. Vég. et Entomol. Agric. France 11: 150–155. 1924.—A wilting of beans in Costa Rica may follow lesions at the base of shoots in which a species of bacterium associated with a coccus form has been found. Both were isolated and are briefly characterized morphologically and culturally. It was experimentally shown that the coccus may be associated with the bacterium in the disease as following natural infection or direct artificial inoculation, but that the latter is the pathogene. However, when the soil was inoculated simultaneously with the 2 species, no infection on bean seedlings followed. This result was shown to be due to the fact that the coccus form inhibits the growth of the pathogenic bacterium either in the soil or in culture media. Indeed, it was found sufficient only to contaminate the seed with the coccus before sowing to prevent development of the pathogenic bacterium.—*J. Dufrenoy.*

6549. Smith, Erwin F. **Les maladies bactériennes des plantes.** [Bacterial diseases of plants.] Rev. Gén. Sci. 36: 134–139. 1925.—In this address the author reviews the development of this branch of plant pathology from its beginnings in the discovery and demonstration of the cause of bacterial blight of pomaceous fruit trees by Thomas J. Burrill in 1877.—Shortly afterward E. Prillieux (1879–1880) studied a disease of rose-colored wheat grains, which he attributed to a pigmented coccus which he found in great quantity in the diseased seed. His writings give the impression of a skilled microscopist only; no cultures or inoculations were made. These studies have not been confirmed; his conclusions must remain in doubt until the disease is found again in France.—In 1883–1889, J. H. Wakker in Holland studied the yellow disease of hyacinths due, according to him, to a yellow bacterium which he called *Bact. hyacinthi*. His investigations were published in a series of papers, but for a time his results did not gain many adherents, in part due, perhaps, to the relative inaccessibility of the language. His cultures and inoculations were not rigorously satisfactory from modern viewpoints, but his results have stood the test of time.—A 4th center of interest for the history of bacterial diseases of plants lies in Italy, where Savastano (1887–1889) made his early observations and

experiments on the olive knot, a disease known from the time of Theophrastus. From diseased tissues he isolated bacteria with which he reproduced the disease; his observations as to the bacterial nature of the disease were later confirmed by Cavara. But Savastano described his bacteria as yellow, undoubtedly due to contaminated cultures. Confusion as to the exact characteristics of the organism persisted among several investigators until in 1893–1895 it was isolated and described by the author under the name, *Bact. Savastanoi*.—In England, a land so fertile in microscopists and mycologists during the latter half of the 19th century, very little impetus was given to the development of this branch of pathology. In Germany, strange to say, in view of her great contributions to other branches of botanical science during this period, the status of bacterial diseases was much the same as in England, due in this case apparently to the blinding effect of *a priori* reasoning. Somewhat later, beautiful investigations were carried out by Spieckermann and by Appel.—The author refers, then, to the duel of words between himself and Alfred Fischer, a controvery which seemed necessary to clear the air for further research. From this time a new area was ushered in, during which increasing numbers of investigators took up this branch of pathology, until now all civilized lands are represented.—Today we know perhaps a hundred bacterial diseases of plants distributed over all parts of the world and occurring in a great many families, from the fungi to the composites. And yet the great continents of South America, Asia and Africa still remain largely to be investigated.—Most cultivated plants are subject to these diseases, but so also are wild plants; bacterial diseases are probably as old as terrestrial vegetation.—After naming some of the principal crop plants subject to these maladies and briefly discussing the different types of bacterial diseases, their modes of attack, the varying results of infection according to external and internal environment, and the methods of dissemination, the author pays tribute to Pasteur whose research methods, modified by time and experience, have been applied to plant as well as to animal investigation.—Modern technique is then reviewed, including the relation of H-ion concentration to culture media; and the different types of control methods are discussed. In conclusion the author states that bacterial diseases are only a small branch of a very large subject, that of plant diseases in general, and recent progress in all branches of phytopathology leads him to predict a large number of discoveries, important for the horticulture and agriculture of all lands, during the next 20 years.—*Frederick V. Rand.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

6550. Ambruster, H. W. **Arsenic, calcium arsenate and the boll weevil.** *vi + 42 p. Fig. 1–2.* Barr-Erhardt Press, Inc.: New York, 1923.—Papers previously published by the author on the arsenic problem are issued together in this pamphlet.—*Lillian C. Cash.*

6551. Hall, W. J. **The insect pests of citrus trees in Egypt.** Ministry Agric. Egypt. Tech. and Sci. Serv. Bull. 45. *1–29.* 1924.—In Egypt, citrus trees suffer very severely from the attacks of scale insects, 12 species of which have been found to attack citrus. These are described and their life histories and distribution in Egypt are given. Other pests treated are the Mediterranean fruit fly, the white fly and 2 species of aphids. Fumigation and control measures against these insect pests are given. Other insects likely to be introduced and the precautions taken at the port of entry are discussed.—*L. C. Cash.*

6552. Heurn, W. C. van. **Die schadelijke insecten van de rijstplant op Java.** [**Insects injurious to rice in Java.**] Meded. Inst. Plantenziek. 61. *i–xv + 1–151 p., fig. 1–48.* 1923.—In the arrangement of the publication the scientific classification of insects is followed. The different stages of the insects are described in detail and their life histories given.—*Lillian C. Cash.*

6553. Kaufmann, O. **Die Weissährigkeit der Wiesengräser und ihre Bekämpfung.** [**The white spike of meadow-grasses and its control.**] Nachrichtenbl. Deutsch. Pflanzenschutzdienst 4: 1–2. 1924.—A physiological disorder of meadow-grasses due to various insects is described. Control measures are discussed.—*W. G. Solheim.*

6554. Mackie, W. W. **Prevention of insect attack on stored grain.** California Agric. Exp. Sta. Circ. 282. 1925.—The use of copper carbonate dust is recommended as an insecticide.—*A. R. C. Haas.*

6555. Taylor, W. P., and J. V. G. Loftfield. **Rodent damage in Arizona ranges.** Carnegie Inst. Washington Year Book 23: 265–266. 1924.

6556. Woglum, R. S. The Argentine ant and mealybugs. California Citrograph 10: 231, 232. 1925.—The citrophilus mealybug by itself is not a serious pest in the interior districts of southern California, apparently being held in check by the warmer temperatures, except in ant-infested districts. In coastward districts this mealybug attains maximum destructiveness even in orchards that are entirely free of ants, and certain orchards have suffered fully a 50% crop loss. Ant control supplemented by cryptolaemus liberation should afford the fullest protection. Government ant syrup is the one dependable means of control.—*C. S. Pomeroy.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

6557. Folsom, Donald. **Experiments and observations in Maine in 1924.** Potato News Bull. 1: 316–317. 1924.—Rugose mosaic reduced the yield of Green Mountain potatoes about 5 times as much as mild mosaic and was found to spread rapidly in Long Island and Virginia but not in Maine. Yellow top or witches' broom was found in Maine and experimentally transmitted. Although late blight was present on the foliage at digging time there was no tuber rot and the yields of sprayed plots were only slightly greater than of unsprayed. Dusting gave results similar to spraying.—*F. Weiss.*

6558. Gilbert, A. H. **Spindle tuber and giant hill.** Potato News Bull. 1: 291–292. 1924.—These 2 potato diseases have been identified in Vermont. Giant hill is characterized by tall, wide branching vines which blossom later and remain green longer than normal plants; the tubers are usually pointed at the bud end or otherwise misshapen.—*F. Weiss.*

6559. Oortwijn Botjes, J. G. **Het optreden van bladrol- en mozaiekziekte in den nabouw van gezonde aardappelplanten, die op grooten afstand groeien van zieke planten. [The occurrence of leaf roll and mosaic in the progeny of healthy potato plants grown at great distance from infected plants.]** Tijdschr. Plantenz. 31: 1–6. 1925.—The progeny of healthy potato plants grown as much as 1200 m. from infected plants developed a high percentage of disease. The author does not exclude the possibility that infection may have been brought over by insects from infected fields located at great distances from his experiment plots, but he is inclined to believe that non-solanaceous plants, affected with mosaic or leafroll, present in and near the experiment plots have served as the source of infection.—*D. Atanasoff.*

NON-PARASITIC DISEASES

6560. Graebner, Paul. **Ueber einige Pflanzenkrankheiten des ungewöhnlichen Sommers 1923 und des folgenden Winters. [Some plant diseases of the unusual summer of 1923 and of the following winter.]** (In: Denkschrift zum 100-jährigen Bestehen der Höheren Gärtnerlehranstalt Berlin-Dahlem früher Wildpark. *306 + 236 + 4 p. Illus.*) *P. 274–276.* Trowitzsch & Sohn: Frankfurt (Oder), 1924.—The summer of 1923 in North Germany was unusually lacking in sunshine and accompanied by frequent periods of rain. These abnormal conditions together with concomitant tardy warming of the soil and lowering of night temperatures affected much of the vegetation adversely. Seed germinated slowly or rotted in the ground. A rolling of the leaves of potato and tomato other than the true leafroll disease was frequently observed. This condition was aggravated by cool nights with accompanying wind. Plants or parts of plants protected did not develop this abnormality.—Various tropical and subtropical plants were also adversely affected.—The abnormally low temperatures of the following winter with cold northeast winds was in many ways catastrophic in its effects.—. Because of the known greater sensitiveness of roots of most woody plants to lowering and fluctuation of temperatures, the diverse influence of soil temperatures on growth or destruction of our sensitive woody plants can not be denied.—*Frederick V. Rand.*

6561. Higgins, B. B. **The blossom-end rot of pepper.** (Abstract.) Phytopathology 15: 50–51. 1925.—This is a physiological disease of pepper (*Capsicum annuum* L.) fruits due to fluctuations in water supply.—*Author.*

6562. Hofker. **Ueber die Einflüsse der Industriegebiete auf die Gehölze. [Influence of industrial districts on woody plants.]** Mitteil. Deutsch. Dendrol. Ges. 34: 156–166. 1924. —The industrial area of the Rhine-Westphalian region in Germany is especially mentioned. An important factor causing damage to plants is smoke. Through mining, the water table

in the soil becomes considerably lowered, under which condition trees may suffer severely. Furthermore, the air humidity may be lowered. The writer suggests that these circumstances should also influence the organisms of the soil. Air temperatures are not unfavorable in the industrial district.—*Eriobotrya japonica* and *Ribes speciosum* went through the winter without being covered. Water and its solvents derived from factories are very harmful. Dust derived from factories will be of little harm, since the stomata are too small to be filled by ash; it also will not adhere readily to the lower leaf surface, where these stomata are located. However, a thick layer of soot on the plants influences the penetration of light into the leaves.—Examples are given of the influence of smoke distribution by wind and the harmful influence of SO_2 gases; SO_2 causes conifers to produce brown needles; leaves of broad leaved plants become brown at the margins and spotted. The gases do not have a bad effect when entering the soil. With the exception of the blue needle varieties which are somewhat resistant, conifers are least suitable for planting in these areas. *Alnus, Betula, Platanus, Salix, Ulmus, Fraxinus,* red horse chestnut, American oak, *Tilia tomentosa, Pterocarya fraxinifolia, Gleditschia triacantha,* and *Ailanthus glandulosa* are recommended for smoky areas.—*J. C. Th. Uphof.*

6563. Newhall, A. G. **Studies on the tip burn disease of lettuce.** (Abstract.) Phytopathology **15**: 58. 1925.—This is a physiological disease due to fluctuations in temperature and in moisture supply.—*B. B. Higgins.*

6564. Ravaz, L., et G. Verge. **Le Rougeau.** *37 p. 2 pl. (col.), fig. 1–11.* A. Dubois & R. Poulain: Montpellier, 1924.—"Rougeau" or reddening of the leaves is probably as old as the cultivation of grapes, since its different forms may be due to various accidental causes or to soil and climatic influences. The specific malady, "rougeau," under discussion appears to have been first mentioned by Fabre in 1853. However, since the use of American vine stock it has not often disturbed the growers until 1920 when it appeared in unaccountable abundance in French vineyards. The symptoms, given in detail, appear mainly as follows: During or following harvest the green leaves become reddened at the margin or in spots over the blade at the principal vein intersections, and progressively this reddening spreads over the whole leaf. Later, brown patches develop at the margin and follow the progress of the reddening. Affected leaves transpire much less than normal leaves, which probably explains the fact that they do not wither but remain until the 1st hard frost. Such leaves are, however, much more susceptible to attacks of hemi-parasites and saprophytes but more resistant to mildew. The branches show few signs the 1st year except a poor ripening of the tips. The following spring growth starts as usual but more slowly. By July, however, it is noted that the tissues do not lignify properly so that the stems soon bend over; the leaves now again develop the symptoms just described. The 3rd year, growth is still more retarded and by summer or the following winter the head dies.—The main branches and the roots overlap one another abnormally and during the 2nd year small cavities develop under the dead bark; these are most numerous in subterranean parts. Histological changes are also described and figured in detail. From the opinions of various writers, and the authors' own observations and experiments, which are discussed, it is concluded that the malady is due to excess water in the soil causing asphyxiation of the root system, this condition being further aggravated in compact clay soils. The disappearance of rougeau when proper aeration was experimentally established seems to demonstrate this point. For prevention of rougeau the author recommends the digging of a ditch and placing of fagots or vine branches either alone or with a drain at the bottom, followed by replacing of the soil and setting out of the vines. In old vineyards these drainage ditches may be established between the rows. The drains made of fagots alone must be renewed every 4–5 years.—*Frederick V. Rand.*

DISEASES OF UNKNOWN CAUSE

6565. Liese, J. **Forstbotanische Mitteilungen.** [Forest botanical notes.] Mitteil. Deutsch. Dendrol. Ges. **34**: 245–248. 1924.—In spring, needles of the green *Pseudotsuga Douglasii* became reddish. Often the upper part of the stem was also red, whereas the lower portion remained green. These symptoms occurred on trees up to 20 years of age but were absent on the older trees. "Frost dryness" in spring is given as a part of the cause, occurring at a time when the soil is still frozen but when the air temperature is already warm. Browning also occurred on such parts as had been apparently damaged before.—*J. C. Th. Uphof.*

6566. Osborne, E. H. Northern field assistant's report. Australian Sugar Jour. 16: 547, 549. 1924.—Second ratoon Badila cane was heavily infected with leaf scald on several farms in the Hambledon area of Cairns district, and in the Mulgrave area 2nd ratoons were badly infected in some places. In the Mossman area, leaf scald existed to a rather marked extent in a block of Green Coru (N. G. 24 B.), 3rd ratoons, and to a lesser extent in an adjoining paddock of 2nd ratoons of the same variety.—Analyses are given of 4 varieties of plant-cane, 12 months old, grown on low land and cut August 30; and of 5 varieties, 2nd ratoons, 11 months old, grown on high land and cut August 13th.—*Nellie E. Fealy.*

6567. Pape, H. Das Ulmensterben in Deutschland. [Dying of elms in Germany.] Mitteil. Deutsch. Dendrol. Ges. 34: 284–288. *1 map.* 1924.—For some time many elms have been dying in the western part of Germany, especially in the Rhine Province. The 1st observations were made in 1921. Since that time the disease has extended considerably. In Holland it has been known since 1919. A map demonstrates that in Germany the disease started from the Dutch boundary. The crowns of diseased trees show a number of dead twigs and carry either brownish shriveled leaves or are entirely defoliated. The young tops are frequently hooked. Shoots dye off first at the tips and then rapidly downward. The bark of these twigs may loosen. Fresh green leaves within 24 hours become yellow and crisp. Often the leaves unfold normally in spring, but, from the end of May on, the shoots are retarded in growth. Defoliated trees may produce new growth. Along avenues and streets whole rows may die out, leaving occasionally a single individual alive. In cross sections of twigs small dark brown spots are found in the wood of certain annual rings, but they do not occur in the heart-wood. The walls of the wood vessels formed in spring as well as the wood parenchyma and the medullary rays are brown. The cell content shows dark-brown masses. In diseased vessels there is an abundant formation of tyloses. No mycelium has been found. Most Ulmus species are affected, but more especially *U. hollandica* and *U. Pitteursii*. The malady has been observed on old as well as on young trees. Many in Holland consider *Graphium ulmi* Schwarz as the cause. However, inoculations with this fungus in Berlin-Dahlem have given negative results. There is no known way of combating the disease.—*J. C. Th. Uphof.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

6568. Anonymous. De herdenking van het 25-jarig bestaan van den Plantenziektenkundige Dienst 29 November 1924. [The celebration of the 25th anniversary of the (Dutch) Plant Pathological Service.] Verslag. en Mededeel. Plantenziektenk. Dienst Wageningen. 37: *1–44.* 1924.—This number contains the addresses given on November 29, 1924, at the celebration of the 25th anniversary of the Dutch Plant Pathological Service. It contains data on the history, organisation and importance of the Service.—*D. Atanasoff.*

6569. Anonymous. Forest diseases and losses, with figures to demonstrate the toll of fungi and diseases. Timberman 26^3: 225–226. *Fig. 1–4.* 1925.

6570. Berly, J. A. Protecting South Carolina from plant diseases and crop pests. South Carolina Agric. Exp. Sta. Circ. 32. *1–31. Fig. 1–22.* 1924.—The endeavors of the State Crop Pest Commission include protection of growers from buying infested nursery products, and assistance to nurserymen and other plant growers in raising clean stock. The discussion of its activities includes the following general topics: Bee disease protection, insecticide and fungicide protection, interstate nursery and other regulations, introduced pests (Mexican bean weevil, Argentine ant, cotton boll weevil), pests of other states, plant diseases and bee diseases.—*Frederick V. Rand.*

6571. Bier, Robert. Value of point of origin inspection on fruits and vegetables. Proc. Florida State Hort. Soc. 1924: 94–97. 1924.—Coöperative organizations, large shippers and growers have inspection or field organizations of their own. The principal criticism raised against this type of service is that the inspector is either unduly influenced in passing judgment on lots of fruits and vegetables by his financiel interest in the product or too often by his fear of displeasing some officer or large grower in the organization in which he is employed. The food products inspection law of the Dept. of Agric. enforced by duly licensed employees who have authority to make inspections covering quality, condition and grade of fruits and vegetables in terminal markets, is described.—*J. C. Th. Uphof.*

6572. Bigot, A., et H. Velu. **Isolement rapide de Cryptococcus mirandei en culture pure.** [Rapid isolation of C. mirandei in pure culture.] Bull. Soc. Path. Exotique 18: 127–129. 1925.—Sabourand's gelatin medium + 5% citric acid, recently found useful in the isolation of *Cryptococcus farciminosus* (see Bot. Absts. 14, Entry 2898) is also suitable for the rapid recovery of *C. mirandei*. Tumor tissue removed with or without precautions of asepsis gave pure cultures of *C. mirandei* after 24 or 48 hours incubation on this medium. Peptonized broth + 5% citric acid, which was also used in isolating *C. farciminosus* has a sterilizing action on *C. mirandei*.—Philip Brierley.

6573. Brooks, F. T. **Moulds on frozen meats.** New Zealand Jour. Sci. and Tech. 7: 286. 1925.—According to the author, a repetition of Wright's experiments (see Bot. Absts. 13, Entry 7316) in the Low Temperature Research Station at Cambridge (England) has invalidated Wright's contention that "black-spot" of meat may be caused by other fungi than *Cladosporium herbarum*.—*H. H. Allan.*

6574. De Vin, Th. J. **Bestrijding van de kersenbladluis en de Monilia-ziekte in de zwarte kersen.** [Control of the cherry aphids and the Monilia disease of cherries.] Tijdschr. Plantenz. 30: 240–243. 1924.—Spraying of the trees during January or February with 7% carbolineum solution controlled the aphids and apparently also the Monilia disease. The latter, while common in other years, did not appear in years when the trees were sprayed with carbolineum.—*D. Atanasoff.*

6575. Ducomet, V., et E. Foex. **Les principales maladies de la pomme de terre.** [The principal diseases of potatoes.] *2d ed. 15 p. 5 col. pl.* Paris, 1924.—(See also Bot. Absts. 14, Entry 638.)

6576. Foster, A. C., and G. F. Weber. **Celery diseases in Florida.** Florida Agric. Exp. Sta. Bull. 173. *21–78. Fig. 14–47.* 1924.—Pink rot (*Sclerotinia libertiana*) is very destructive and causes a damping-off of young plants in seedbeds, a light pinkish rot of stalks in the field during any stage of the growth, and a watery soft rot in transit. Decay is most common on plants that have been papered for blanching. It is prevalent in Florida. The disease on older plants is usually found near the surface of the ground, the fungus probably entering through injuries or growth cracks and gradually growing up the stalks. It spreads rapidly over the entire plant and when the dead plant dries up or decays to the ground the sclerotia drop into the soil. Under Florida conditions these sclerotia may live for several years in the soil. The disease cannot be controlled effectively by Bordeaux mixture, although spraying the lower portions of the plant is recommended as a precaution. It is safest to remove all affected plants and burn or bury them deeply. It is recommended to keep a dry mulch over the soil by frequent cultivation.—On account of climatic conditions, early blight (*Cercospora apii*) is more destructive in Florida than in other states. In October it appears in the seedbed, from which it is carried to the fields. During cool weather the spread is considerably checked, but from March to the last of May it becomes prevalent. This disease can be controlled by thorough spraying with 4–4–50 Bordeaux mixture, 150 gallons to the acre. The spray should be applied first in the seedbed as soon as the young leaves begin to develop, and once a week thereafter.—Dust applied twice a week at the rate of 40 pounds to each application gave as good control as 100 gallons of liquid Bordeaux mixture. It should be applied when the plants are wet; applied at midday, when the plants were dry, it gave no better control than untreated plots.—Late blight (*Septoria petroselini apii*) is a cool weather disease. It was found that warm weather the latter part of April was important in controlling this disease. There were apparently 2 strains of the fungus in the Sanford district. One strain produced lesions that were distinguished with difficulty from early blight lesions. The other strain produced a small lesion which is easily detected and identified. The production of pycnidia was often delayed in the larger lesions. For control, use disease-free seed, plant 2–3-year old seed, or treat the seed in hot water or corrosive sublimate. Follow with 4–4–50 Bordeaux mixture at least once a week.—Blackheart often causes greater losses to Florida celery growers than any other fungus. It is non-parasitic, but saprophytic organisms usually enter the diseased parts later and further promote decay. When nitrate of soda was applied at the rate of 500–2000 pounds per acre, blackheart failed to appear. Fields should not be allowed to become dry and then suddenly flooded; good drainage is necessary to prevent blackheart.—

Root-knot (*Heterodera radicicola*) is very serious. For control, the seedbeds should be disinfected with sodium cyanide and ammonium sulphate. Distribute sodium cyanide, dissolved in water, at the rate of 800 pounds per acre, over the plowed soil in the seedbed, and then irrigate so as to wash the chemical into the soil. Just before the land is completely saturated with water, ammonium sulphate is applied at the rate of 1200 pounds per acre and washed down. Calcium cyanide may be substituted for sodium cyanide and ammonium sulphate at a considerable saving of cost.—Damping-off (*Pythium de baryanum*, *Sclerotinia libertiana*, *Fusarium* spp. and *Rhizoctonia* spp.) in seedbeds is discussed.—Mosaic has been reported occasionally.—Root rot (*Rhizoctonia* spp.) is common, and is most frequent on young plants. Sterilizing the seedbeds is advised.—Slimemold (*Physarum cinereum*) is not often found on celery.—The non-parasitic diseases found include the following: (1) Cracked stem, causing a transverse cracking of the epidermis above the vascular bundles, may be due to unbalanced fertilizers, climatic and moisture conditions, or excessive amounts of lime. (2) Stunting is often caused by improper setting. (3) Growth cracks at the base of the stalk are common in Florida, not only reducing the value of the celery but also leaving openings for fungi to enter. (4) Hollow stem or pithiness is of considerable importance. It is said to be a seed-borne characteristic, especially in American-grown seed. French-grown seed is relatively free. In Florida its prevalence varies widely from season to season. (5) Brown stem causes peculiar browning in the outer stem. It disfigures the plant and is probably followed by decay in transit. It occurs frequently in plants affected with blackheart; possibly both are due to the same cause. (6) Red rot may be caused by extremely acid soils.—Thus far bacterial leaf spot (*Bacterium apii*) has not been found in Florida.—*J. C. Th. Uphof.*

6577. Güssow, H. T., and J. H. Faull. **Plant pathology in Canada.** In: **Handbook of Canada.** *P. 229–237.* Univ. of Toronto Press: Toronto, 1924.—The history of plant pathology in Canada is very briefly treated and the present organization of the phytopathological work of the Federal Government is described.—*Lillian C. Cash.*

6578. Hesler, Lex R., and Herbert Hice Whetzel. **Manual of fruit tree diseases.** *xx + 462 p. Fig. 1–126.* MacMillan Co.: New York, 1920.—"In recent years scientists and laymen alike have recognized the importance of certain technical details regarding the cause in order to undertake the prevention of . . . . losses. Similarly, the value of other facts must be apprehended, such as the history of the disease, where it originated, with what rapidity the pathogene has spread, the losses it is capable of incurring, and under what conditions these destructive outbreaks (epiphytotics) occur. . . . . It is hoped that this Manual will give to the fruit-grower such information on fruit diseases as is available to date. . . . . The grower is in the habit of grouping his troubles as well as his labor and projects. . . . . Accordingly, only fruits are included in this manual. It is hoped that other crops may be the subject of similar manuals in the future. . . . . The arrangement of the fruits in the text, that is, alphabetically, is simple and therefore useful." The diseases of the following fruits are discussed: Apple, apricot, blackberry, cherry, cranberry, currant, gooseberry, grape, peach, pear, plum, quince, raspberry, and strawberry. A chapter on fungicides, their preparation and application is included; and an appendix lists some books and journals that contain information on fruit diseases and adds a glossary of technical terms.—*Frederick V. Rand.*

6579. Jeaume, G., et M. Dekester. **Isolement de l'agent pathogène de la Blastomycose des voies lacrymales.** [Isolation of the pathogenic agent of blastomycosis of the tear ducts.] Bull. Soc. Path. Exotique **18**: 124–127. *Illus.* 1925.—The authors report isolation in pure culture, successful inoculation and reisolation, and some details of the morphology of **Cryptococcus mirandei.**—*Philip Brierley.*

6580. Jehle, R. A., F. W. Oldenburg, and C. E. Temple. **Relation of internal cob-discoloration to yield in corn.** (Second progress report.) (Abstract.) Phytopathology **15**: 52. 1925.

6581. Komuro, Hideo. **The cells of Vicia faba modified by Röntgen rays, and their resemblance to malignant tumor cells with the cytological observations of tumors.** Japanese Jour. Bot. 2^3: 133–156. *Pl. 7–8, fig. 1–12.* 1924.—This is a continuation of previous studies (See Bot. Absts. 14, Entries 1186, 1187, 5123) using Okuro's gas tube with tungsten anticathode, and current of 2–2.5 milliamperes. A water cell was inserted between bulb and material to prevent

interference of the thermal factor. Benda's modification of Flemming's fixative and Flemming's triple stain and iron-hematoxylin were used.—The degenerative cytological changes following irradiation included abnormal mitoses, irregular distribution of chromosomes, change of form and content of the nucleus, shrinking of protoplast from cell wall, vacuolization, occurrence of hyperchromatosis, karyolysis and pycnosis, and the appearance of multinucleate cells.—Where metabolism was vigorous these degenerative changes progressed more rapidly than in steeped seed.—Even in the vigorously growing root tip, degenerative changes accompanied by prepycnosis occurred. There was no marked difference in growth or cytological changes with irradiation at 20, 40 and 50 H.—In tumor cells the author found 3 types of nuclei. The 3rd type occurs in old tumor cells with enlarged nuclei, but little chromatin, and many nucleoli, often vacuolated. Giant cells and giant nuclei occurred, irregular in size and shape. Nuclei of polymorphic cells were irregular. Multipolar or asymmetrical mitotic figures were found. Cell arrangement was disturbed and the chromatic content became hypo- and hyperchromatic. Vacuolization of the nucleolus, and karyolitic and pycnotic cells prevailed.—Tumor nuclei may multiply by both mitosis and amitosis or by the latter alone.—From the results obtained the author concludes that irradiation of seed, seedlings and young plants with X-rays leads the cells of the vigorous growing-point to a diseased or senescent condition resembling that of malignant tumor cells, and finally to the death of the cell.—*Frederick V. Rand.*

6582. Lwoff, A. **Chytridinées parasites des Amibes de l'homme. Possibilité de leur utilisation comme moyen biologique de lutte contre la dysenterie amibienne.** [**Chytridineae parasitic on the Amoebae of man. Possibility of their utilization as a biologic means of control of amoebic dysentery.**] Bull. Soc. Path. Exotique **18**: 18–23. *1 fig.* 1925.—A Chytrid observed in *Entamoeba coli* and *E. dysenteriae* from a human stool is briefly described and sketched from material preserved in formalin. A plasmodial and a sporangial stage were seen but not the spores or their manner of emergence. The fungus is referred to *Sphaerita endogena* and is considered provisionally identical with forms recorded in *Endolimax nana* and in *Valkampfia limax*. Inasmuch as the Chytrid has been detected only in the vegetative stages of its amoebic hosts the author reasons that its presence either prevents encystment or destroys the affected cell after encystment. If either assumption is true in the case of *Entamoeba dysenteriae* a severe infection by the Chytrid might serve as an accessory means of control of this parasite of man.—*Philip Brierley.*

6583. Morstatt, H. A. **Einführung in die Pflanzenpathologie; ein Lehrbuch für Land- und Forstwirte, Gärtner und Biologen.** [**Plant pathology; a textbook for agriculturalists, foresters, gardeners and biologists.**] *viii + 159 p. Fig. 1–4.* Gebrüder Borntraeger: Berlin, 1923.—The following subjects are treated: Symptoms of plant disease, methods of investigation, conditions and methods of attack, pathological plant anatomy, pathological plant physiology, plants producing disease, animals causing diseases and injuries, nonliving causes of disease, and plant protection.—*Lillian C. Cash.*

6584. Muller, H. R. A. **Onderzoekingen naar den invloed van eenige ontsmettingsmiddelen op de kiemkracht van tomaten- en selderijzaad.** [**Effect of fungicides on the germination of tomato and celery seed.**] Tijdschr. Plantenz. **31**: 75–85. *5 fig.* 1925.—With only 1 exception (the celery variety "Venlo") all tomato and celery varieties are more or less injured when disinfected with Germisan, Uspulun, and formalin. Both Germisan and Uspulun (0.125%) gave better results with tomato seed treated for an hour than for 30 minutes. Tomato and celery seed treated with formalin (0.25%) gave better results when treated for 30 than for 15 minutes.—*D. Atanasoff.*

6585. Newell, Wilmon. **Report of plant commissioner for the biennium ending June 30, 1924.** Florida State Plant Bd. Quart. Bull. **9**: 59–117. 1925.—The chief departmental activity consisted in citrus canker eradication and grove inspection. The total cost up to June, 1924, involved an expenditure of $1,718,037.45 which does not include the value of trees destroyed in the campaign.—Under the Florida system of nursery inspection, each package or lot of nursery stock, when moved from the property where grown, must have a certificate tag attached.—Inspectors of the Quarantine Department are stationed at the maritime ports and the principal rail gateways. In January 1924, in Dade County, coconut-bud-rot (*Phyto-*

phthora faberi) was found in several plantings in and near Miami and Miami Beach. Quarantines have been imposed on all plantings wherein diseased palms have been found and all diseased trees have been destroyed.—Mosaic of sugar cane has been found in cane fields in a number of West Florida counties. Efforts at eradication proved ineffective, mainly because of the indifference or inactivity of cane planters. As a result the disease has become very firmly established in the earlier affected areas. Cayana 10 is resistant to mosaic.—A list is given of plant pests and diseases intercepted by the State Board in 1922–1924.—*J. C. Th. Uphof.*

6586. Newhall, A. G. **Dusting celery seedbeds to control blights.** (Abstract.) Phytopathology **15**: 50. 1925.

6587. Poetren, N. van. **De Plantenziektenkundige Dienst in Nederland. [The Phytopathological Service in the Netherlands.]** Verslag. en Mededeel. Plantenziektenk. Dienst Wageningen **36**: *1–71. Map.* 1924.—This publication, issued for the 25th anniversary of the Dutch Phytopathological Service treats of its history, organization and activities, which fall in the following groups: Advisory work and investigations, extension work, ornithological work, exhibits and collections, inspection and carrying out of legal regulations in connection with the fighting of plant diseases, and the export of plant products. A special chapter is devoted to the importance and the results obtained by the Service.—*D. Atanasoff.*

6588. Quanjer, H. M. **Vergelijking tusschen den gezondheidstoestand van Schotsche en Noord-Hollandsche pootaardappelen. [Comparison between the health of Scotch and North Holland seed potatoes.]** Tijdschr. Plantenz. **31**: 7–10. 1925.

6589. Quanjer, H. M., en D. L. Elze. **Achteruitgang van pootgoed van gelijke afstamming in de verschillende vroege-aardappeldistricten. [Running out of potatoes from some seed stock in the various early-potato districts.]** Tijdschr. Plantenz. **31**: 11–14. *2 pl.* 1925. —Progenies of plants from the same seed stock but grown at different places showed widely differing percentages of diseases.—*D. Atanasoff.*

6590. Rose, R. C. **Seed treatment centers popular in Minnesota.** Potato News Bull. **1**: 317–320. 1924.—The use of hot formaldehyde dip in community treating tanks has been successful in reducing the amount of scab and Rhizoctonia affecting potatoes.—*F. Weiss.*

6591. Rushton, Wilfred, and P. A. Aubin. **Applying copper sulphate.** Water Works Issue, Engineering and Contracting **63**[1]: 125–126. 1925.—The sulphate was applied as a solution (1 pound to 5 gallons) by means of "an ordinary agricultural spraying machine from a boat" on 3 separate days at rates of 0.05 parts per million per day (total 0.15 parts per million). Excellent results were obtained at a cost of less than $2.30 per acre. Two reservoirs of 33,000,000 and 11,000,000 gallons capacity each were treated in June and July, 1924. (An English experience).—*H. B. Foote.* (*Public Health Eng. Absts.*)

6592. Sherbakoff, C. D. **Use of agar blocks for photographing living spores.** (Abstract.) Phytopathology **15**: 44. 1925.

6593. Spierenburg, Dina. **Kool: Rotstronken, stippel- en randjeskool. [Cabbage storage diseases.]** Tijdschr. Plantenz. **30**: 229–240. *9 pl.* 1924.—(See Bot. Absts. **14**, Entry 2916.)

6594. Stadler, L. J. **The variety as a unit in studies of disease resistance.** (Abstract.) Phytopathology **15**: 51. 1925.

6595. Taubenhaus, J. J. **Diseases of truck crops and their control.** *xxxi + 396 p. 72 fig.* E. P. Dutton & Co.: New York, 1918.—Part I is devoted to a study of normal and sick soils with methods of treating them.—Part II gives a general discussion of the healthy host and its requirements, causes of diseases in crops, diseases due to parasitic bacteria or fungi, diseases induced by parasitic flowering plants and poor seed.—Part III comprises the greater part of the book and treats the specific diseases of truck crops, different families of plants being treated in separate chapters.—In Part IV are given methods of control, including control of insect pests by natural factors, treatment of fence posts, and a glossary.—*Lillian C. Cash.*

6596. Wahl, Ernst. **Hexenbesen auf Philadelphus. [Witches brooms on Philadelphus.]** Mitteil. Deutsch. Dendrol. Ges. **34**: 384. 1924.—A witches broom was found on *Philadelphus coronarius* on the Weiher near Braunfels, Germany. It had a diameter of 50 cm. The leaves were smaller than those on the normal part of the shrub.—*J. C. Th. Uphof.*

6597. Walker, J. C. **On the nature of disease resistance in plants.** Trans. Wisconsin Acad. Sci. 21: 225–247. 1924.—A survey of the recent literature on disease resistance is discussed under the titles of types of disease resistance, relation of environment to resistance, genetic behavior of resistance, and classes of true resistance. The possible causes of true resistance are treated in relation to the external structure and the internal character of the host. The nature of rust resistance is considered. Cell membranes, chemotropism, osmotic pressure, cell sap acidity, tannin, anthocyans and flavones, and other cell contents are discussed as internal causes determining resistance. A bibliography of 95 entries is appended.—*E. L. Fisk.*

6598. Whetzel, H. H. **Bibliographie der Pflanzenschutzliterature.** [Bibliography of plant protection literature.] Phytopathology 15: 43. 1925.—Attention is called to this journal issued for exchange by the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem.—*B. B. Higgins.*

6599. Whetzel, H. H., Lex R. Hesler, Chas. T. Gregory and W. Howard Rankin. **Laboratory outlines in plant pathology.** 2nd ed. *231 p.* W. B. Saunders Co.: Philadelphia and London, 1925.—"These outlines are intended for students taking a regular four-year course in college or university. They are designed for the purpose of effectively acquainting the student with the laboratory materials presented and are the result of years of experience and test in actual practice work. As here presented these outlines constitute a complete revision of those published in the original edition of 1916. . . . . For all these changes full responsibility lies with the senior author.—Although the acquisition of a body of facts is an important and necessary part of the work in such a course, a more vital feature is the training in logical methods of acquiring them. . . . . The grouping of diseases here presented is, I believe, an important step in calling attention to the domination of systematic mycology in phytopathologic teaching and writing, and of directing it toward the more logical classification and study of diseases on the basis of the pathologic phenomena exhibited. At the same time the subgrouping of the diseases provides for an introduction to the chief groups of etiologic agents."—The introductory sections discuss symptomatology, the literature of plant diseases, the term paper. Following this the main body of the "outlines" takes up plant diseases of the 3 main types—necrotic, hypoplastic and hyperplastic diseases. Under these 3 main headings the specific diseases are grouped according to cause. In each case the subject matter is treated under symptomatology and etiology, with literature references appended. Bacterial, fungous, virus, nematode and physiogenic diseases are included.—A section on laboratory technique and a glossary terminate the volume.—*Frederick V. Rand.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 6040, 6067, 6270, 6271, 6272, 6273, 6274, 6290, 6334)

6600. Bunting, B., and C. D. V. Georgi. **The oil palm in Malaya.** Malayan Agric. Jour. 12: 145–153. 1924.—An account is given of the cultivation of *Elaeis guineensis*, with notes on varieties, germination of seed, planting out, pollination, pests and diseases, harvesting, composition of fruit, extraction, uses and value of the oil.—*R. E. Holttum.*

6601. Burkill, I. H. **A Chinese belief regarding Phyllocactus Hookeri Walp.** Gard. Bull. Straits Settlements 3: 280. 1924.—In Amoy there is a belief identifying a precious plant, known in the Sung dynasty, with *Phyllocactus Hookeri*, and this species is locally supposed to have great value as a drug.—*R. E. Holttum.*

6602. Burkill, I. H. **Cleome chelidonii L. fil. in the Malay Peninsula.** Gard. Bull. Straits Settlements 3: 280–281. 1924.—This species and *C. viscosa* are both sold fresh as drugs by Chinese in Penang; it must be added to the flora of the Malay Peninsula.—*R. E. Holttum.*

6603. Burkill, I. H., and R. E. Holttum. **Dioscorea piscaturum or tuba-ubi, a fish poison.** Gard. Bull. Straits Settlements 3: 260. 1924.—This spinous yam, occurring in the

Malay Peninsula and Sumatra, has poisonous properties similar to those of *Derris elliptica;* an experiment proving its toxicity to fish is described.—*R. E. Holttum.*

6604. Eaton, B. J., and C. D. V. Georgi. **Patchouli oil.** Malayan Agric. Jour. 12: 191–196. 1924.—An account is given of the cultivation of *Pogostemon patchouli* and of the extraction, yield and uses of the oil,—*R. E. Holttum.*

6605. France. Comité Régional d'Algérie. **Répertoire des plantes médicinales de l'Afrique du Nord. Guide pour les Récolteurs de plantes médicinales.** [Report on the medicinal plants of North Africa. Guide for the collector of medicinal plants.] *P. 1–62.* C. Vollot: Alger, 1924.

6606. Georgi, C. D. V. **Vetiver Oil.** Malayan Agric. Jour. 12: 197–199. 1924.—The grass, *Vetiveria zizanioides* Stapf, has been cultivated at the Serdang Experimental Plantation. A report on the cultivation and yield is given. The oil produced is of normal character.—*R. E. Holttum.*

6607. Greenstreet, V. R. **An investigation of the toxicity of the lima bean (Phaseolus lunatus).** Malayan Agric. Jour. 12: 107–109. 1924.—The beans used were grown in Perak from American seed. The original beans were streaked with purple, but after 5–6 generations of cultivation they had lost this color and the ones used were white. They were extracted in various ways and about 0.02% of cyanogenetic glucoside was found, yielding 0.002% HCN, on hydrolysis. This is a rather harmless amount.—*R. E. Holttum.*

6608. Herbig, Walthier. **Die öle und fette in der textilindustrie.** [Oils and fats in the textile industry.] *4 + 302 p. Illus.* Wissenschaftliche Verlagsgesellschaft: Stuttgart, 1923.

6609. Mehring, A. L. **Total ash determination in spices.** Jour. Agric. Res. 29: 569–574. 1924.—The author claims that most of the figures, available in the literature, represented to be the percentage of ash in spices were obtained with a very limited number of samples, that such results are not likely to be representative nor accurate enough upon which to base decisions in food control, as the amount of ash is here shown to vary considerably in spices from the same source from year to year and in samples from different localities in the same year. In an effort to eliminate the effect of these and other factors, weighted averages of about 7000 determinations made on material of known purity by many different analysts over a period of 40 years in many parts of the world, were prepared. About ⅓ of these were made in the U. S. Meat Inspection Laboratory, and have not hitherto been published. The percentages of ash for air-dried material are as follows: allspice 4.51, anise 6.85, bay leaves 4.63, caraway 6.73, cardamom fruit 6.71, cassia bark 4.28, celery seed 8.35, cinnamom bark 4.05, cloves 6.15, coriander 5.38, cumin 7.63, fennel 8.12, ginger 4.89, mace 2.26, marjoram 10.62, mustard seed 4.83, mustard flour 5.49, nutmeg 2.45, onion 4.28, paprika 6.78, black pepper 5.03, cayenne pepper 6.17, other red varieties of pepper 6.47, white pepper 1.26, safflower 6.67, saffron 5.38, sage 7.39, savory 9.94, star anise 2.63, thyme 9.83 and turmeric 6.37. It is believed that no pure spice will vary more than 30% from the above figures. Analyses made on a small number of samples by the author only give the following: basil 15.12, calamus 4.64, capers 2.11, cassia buds 4.71, charlock 6.15, dill 9.88, fenugreek 3.01, garlic 6.43, juniper berries 2.71, parsley 11.70, tarrican 10.43 and vanilla beans 4.78. Complete chemical analyses of the ash obtained from 9 of the above named spices, together with a bibliography of 111 citations on the chemistry of spices are appended.—*A. L. Mehring.*

6610. Paerels, J. J. **Eenige aetherische olien uit Ned.-Indie.** [Some etherial oils from Dutch-India.] Cultura 34: 257–261. 1922.—Cajuput (Kaja-poetih) oil is derived from the leaves of *Melaleuca Leucadendron* L. There are different varieties in Boeroe, Ceram and some of the Molucca Islands. The oil is obtained by distillation from a wooden barrel. Crude oil has a green color caused by the presence of copper salts of butyric and valerianic acid. Kananga oil is derived from flowers of *Canangium odoratum*, Baill. At present they are planted along roads and on soils which cannot be used longer for rice growing, especially in Bantam. They are grown from seed sown in beds and afterward planted 5–7 m. apart. Trees grown in low altitudes produce better oil than those higher up. Tjempaka oil comes from flowers of *Michelia champaca* L. and *M. longifolia* Bl. which contain only 0.012% of oil. Patchouli-oil is derived from *Pogostemon Patchouli* Pellet, some varieties of which are grown

in Java. They can best be cultivated on heavy but low soils and are propagated by cuttings or runners. The leaves are harvested during dry weather, partially dried, placed in heaps to ferment, dried again and finally distilled. Leaves are also sent to Europe for oil extraction. Oils derived from grasses include citronella oil from *Cymbopogon Winterianus* Jowitt, lemongrass oil from *Cymbopogon citratus* Stapf and vetiver oil from *Andropogon muricatus* Rex.—*J. C. Th. Uphof.*

6611. Seddon, H. R. **A vine poisonous to stock.** (**Marsdenia rostrata.**) Agric. Gaz. New South Wales 36: 99–103. 1925.—Experimental results demonstrated that this plant is highly poisonous to ruminants and pigs, the toxic material being found in the leaves. Flowering parts and stems were not specifically tested. Lethal results for weaned pigs were secured from 2 ounces of green leaves, while 6 ounces were needed to kill sheep. The toxic principle was not identified with certainty. The plant is native to the coastal districts in the eastern portion of Australia. Full experimental results will appear later in another journal.—*L. R. Waldron.*

6612. Sjollema, B. **Over de vergiftigheid van het katoenzaadmeel.** [**Poisonous properties of cotton seed meal.**] Landbouwk. Tijdschr. 37: 4–9. 1925.—Many causes of poisoning of cattle by soja beans are recorded from Noord Brabant, Holland, and from the Rhine Province, Germany. Poisoning from cotton seed meal shows very similar symptoms, the poisonous substance being gossypol.—*J. C. Uphof.*

6613. Sowerby, A. de C. **Opium and narcotics in China.** China Jour. Sci. & Arts 1: 425–427. 1923.—The author states that the opium poppy (*Papaver somniferum*) is again flourishing in the western provinces, in Fukien, Manchuria, and many other districts. He calls attention to the great increase in the narcotic trade the past 5 years and discusses the physiological effects of opium and its derivatives at length. He states that the Indian government justifies the sale of opium on the ground that it is eaten as a prophylactic against malaria. Cushing is quoted as stating that of the 3 methods, smoking, eating, and injecting, the 1st seems the least harmful.—*J. T. Illick.*

PHYSIOLOGY

B. M. Duggar, *Editor*

W. J. Robbins, *Assistant Editor*

(See also in this issue Entries 6041, 6047, 6091, 6103, 6108, 6113, 6115, 6120, 6131, 6179, 6181, 6182, 6193, 6200, 6201, 6257, 6300, 6332, 6335, 6347, 6403, 6408, 6465, 6540, 6581)

GENERAL

6614. Collins, Geo. E. **Some physical properties of cotton cellulose and its modification. A summary of existing data.** (British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 13: T 204–213. 1922.—The author discusses briefly the specific gravity of cotton cellulose; specific inductive capacity; electrification; mechanical absorption of liquids; thermal effects of accompanying water adsorption; changes due to heat and cold; thermal conductivity; specific heat; heat of combustion; heat of reaction; refractive index; double refraction and appearance of polarized light; action of ultra-violet light; optical activity of sols; ultramicroscopy; and evidence of X-rays on structure.—A bibliography of 87 titles is included.—*Frederick V. Rand.*

6615. Liesegang, Raphael Ed. **Chemische Reaktionen in Gallerten.** [**Chemical reactions in colloids.**] *2nd ed. 90 p. 39 fig.* Theodor Steinkopf: Dresden & Leipzig, 1924. —The work is divided into 14 chapters and the following topics may be noted: Methods employed; reactions within and outside of gels; the Pringsheim rule; the degree of dispersity of the reaction products of gels; hydrolytic separation: formation of colloids during chemical processes; the phenomena incident to the drying of gels; rhythmical precipitation; influence of changes of external conditions; and precipitation and solution of lime compounds in colloids.—*J. C. Th. Uphof.*

PROTOPLASM

6616. Lenz, W. Protoplasmastudien an Saprolegnia. [Protoplasm studies on Saprolegnia.] Mez, Bot. Archiv. 5: 435–438. 1924.—If zoosporangia of Saprolegnia, especially young stages, are treated with water-absorbing matter, death phenomena appear. The granular protoplasm aggregates, leaving the remainder of the cell filled with a clear cytoplasmic mass. —*Carl Mez* (*transl. by William Seifriz*).

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL RELATIONS

6617. Goldsmith, G. W., and J. H. C. Smith. **Physical properties of the sap of Engelmann spruce.** Carnegie Inst. Washington Year Book 23: 247–248. 1924.

6618. Korstian, C. F. **Density of cell sap in relation to environmental conditions in the Wasatch Mountains of Utah.** Jour. Agric. Res. 28: 845–907. *5 fig.* 1924.—Some 775 determinations of the density of the cell sap of trees, shrubs, and herbs are given in a range extending from the desert, at an altitude of 4,000 feet, to the mesophytic spruce-fir forest, at 10,000 feet. The determinations were made by the well-known freezing point depression method.—The measurements of the physical factors of the environment are presented graphically in 4 charts.—The author concludes that sap density may be used as an index of habitat in correlating the great complex of environmental factors with the physiological responses of the plant. It may be influenced by any of the habitat factors affecting transpiration, the products of photosynthesis, or the supply of available soil moisture. Osmotic pressure in plants is influenced more by the moisture relations than by temperature or light. Ligneous plants have a higher concentration than herbaceous plants; shade plants, a lower density than sun plants of the same species; young leaves and shoots, a lower concentration than older tissues. This last explains the greater sensitiveness of young growing shoots to frost. In winter the conifers have a low density, while evergreen, broad-leaved shrubs have a high concentration. This reversal of the summer relationships is due to the fact that the conifers in winter transform the starch into oils and fatty substances, osmotically inert, whereas the evergreen shrubs convert the starch into soluble sugar which greatly increases osmotic action. —An increase in concentration is generally found on dry or exposed sites as compared with more favorable situations. The same species has a higher sap density at the lower than at the upper extremities of its range, except that as timber line is approached the concentration of the sap is increased. Sap density determinations are shown to have a practical bearing in silviculture, particularly in reforestation. The possibilities of various species on dry sites may be tested by comparing their normal range in osmotic pressure with that exhibited by native plants on the area. A bibliography of 121 references is appended.—*Author.*

6619. MacDougal, D. T. **Concentration of cell-contents, absorption of water, and penetration of electrolytes into plant-cells.** Carnegie Inst. Washington Year Book 23: 127–129. 1924.

6620. MacDougal, D. T. **Influence of H- and OH-concentration on hydration and permeability.** Carnegie Inst. Washington Year Book 23: 129–130. 1924.

6621. MacDougal, D. T. **Distensions of living cells of Opuntia illustrative of the influence of H- and OH-ions and salts on hydration and permeability.** Carnegie Inst. Washington Year Book 23: 130. 1924.

6622. MacDougal, D. T. **Relative effects of ions on permeability of unstable and constantly varying cell-layers.** Carnegie Inst. Washington Year Book 23: 130–131. 1924.

6623. Mann, C. E. T. **The antagonism between dyes and inorganic salts in their absorption by storage tissue.** Ann. Bot. 38: 753–777. *8 fig.* 1924.—This investigation was undertaken for the purpose of studying the mutual influence of inorganic salts and dyes on the absorption of these substances by mangold tissues. It was found that the acid dyes were absorbed by mangold to a much smaller extent than the basic dyes. With the inorganic salts, the results show that absorption is practically the same from decinormal solutions of ammonium and aluminium chlorides, but is considerably slower in the case of magnesium chloride. The presence of a salt in solution of a dye antagonizes the intake of the dye by living tissue, but the magnitude of the antagonistic action is a function of the valency of the salt and its concentration. The colloid precipitation theory of the plasma-membrane as

formulated by Kahho receives support from phenomena of antagonism investigated, and affords a possible explanation of the relationship existing between the degree of antagonism and the valency of the cation of the antagonizing salt.—*M. Newton.*

6624. Osterhout, W. J. V. Continuation of investigations on permeability in cells. Carnegie Inst. Washington Year Book 23: 238. 1924.

6625. Schmetz, L. Untersuchungen über den Einfluss einiges Aussenfaktoren auf den Stärke-Abbau in Laubblättern. [Investigations of the influence of some external factors on the starch translocation in foliage leaves.] Mez, Bot. Archiv. 10: 16–33. 1925.—Oxygen is essential for starch translocation in foliage leaves, yet $\frac{1}{15}$ of the normal air content suffices. Contrary to the work of Stahl, the author obtained no retardation after spreading fat or gelatine over a part of the cuticle.—Increased water content was found to diminish starch withdrawal, while, in most plants investigated wilting increased the translocation. However, in water plants and succulents, starch translocation is not favored by wilting.—Strong light favors starch withdrawal, probably through incipient wilting, but it also results in closure of the stomata and consequent lowering of assimilation, so that the increased translocation may be apparent rather than real.—Salts in equimolecular solutions uniformly increase starch translocation in assimilating cells; as do also higher concentrations of sugar. These solutions probably act through withdrawal of water.—Narcotics in lower concentrations accelerate starch transfer. In general, the starch in the mesophyll tissue behaves differently toward external factors than that in the guard cells ("Sparstärke" of Ziegenspeck). —*Carl Mez (transl. by F. V. Rand).*

6626. Sorensen, S. P. L., and K. Linderström-Lang. On the determination and value of π_0 in electrometric measurements of hydrogen ion concentrations. Compt. Rend. Trav. Lab. Carlsberg 15^6: 1–40. 1924.—This formulates a series of proposals for standardization of nomenclature and methods in electrometric measurements, along the lines suggested by Clark (The determination of hydrogen ions, *2nd ed.*). These proposals are: (1) A distinction should be made between concentration and activity of H ions. (2) In statements of concentration of H-ions, the terms CH, pH, and π_0 should be used, the latter being defined as "the electromotive force of a cell of which the left half consists of 0.1 N potassium chloride-calomel-mercury electrode, the right half consisting of a hydrogen-platinum electrode in an electrode liquid having a concentration of hydrogen ions of 1 normal at 18° and with a hydrogen pressure of 1 atmosphere dry hydrogen, the diffusion potential being taken as eliminated." At 18°C. the value of π_0 is 0.3380 volts. (3) In stating the activity of H ions the terms aH, paH, and a π_0 should be used indicating, respectively, activity, exponent of activity, and the π_0 derived as in (2) except that the electrode liquid has a 1 N activity of H-ions instead of the corresponding concentration. The value of a π_0 at 18° is 0.3357 volts. (4) The variation in value of π_0 according to temperature should be fixed in accordance with Clark's proposal. A table is given for conversion of values obtained at any temperature with the 1 N and 3.5 N calomel electrodes to those obtainable with the 0.1 N electrode at the corresponding temperature, but the saturated electrode should never be used as a standard, only as a working electrode. (5) The necessary corrections for the use of a quinhydrone in place of a hydrogen electrode are stated. (6) In highly accurate measurements the constancy of the calomel electrodes should be tested against freshly prepared electrodes of the same sort or against a hydrogen electrode in the electrode liquid 0.01 N HCl + 0.09 = N KCl. (7) The formulae for the cells measured should be stated so that a positive sign for E indicates the half cell to the left in the formula as the positive pole.—*E. Weiss.*

6627. Stiles, Walter. The absorption of salts by storage tissues. Ann. Bot. 38: 617–633. *4 fig.* 1924.—The absorption by storage tissue of an inorganic salt from its solution in water is characterized by an unequal absorption of the constituent ions of the salt. The balance between the oppositely charged ions in the external solution is maintained by the diffusion out from the tissue of ions charged similarly to the ions absorbed in excess. The ions are absorbed comparatively rapidly at first, but after the first 5–6 hours the rate of absorption slows down considerably. The absorption of each ion proceeds towards an equilibrium position which is not determined by equality of concentration within and without the tissue, but which is dependent on the concentration of the salt. These findings indicate that

the absorption of salt by storage tissues cannot be a simple process of diffusion of salt through a cell membrane.—*M. Newton.*

6628. Trumpf, Cr. Ueber das Wachstum von Phaseolus-Keimlingen im Press-Saft normaler und etiolierter Pflanzen. [Growth of Phaseolus seedlings in expressed sap of normal and etiolated plants.] Mez, Bot. Archiv. 5: 410–412. 1924.—The theory of Coupin that differences in growth of seedlings grown in sap from etiolated and normal plants is due to a specific growth regulating substance is disproved. The author believes that these differences are due solely to differences in concentration and osmotic value of the 2 saps.—*Carl Mez (transl. by William Seifriz).*

WATER RELATIONS, TRANSLOCATION

6629. Ahrns, W. Weitere Untersuchungen über die Anhängigkeit des gegenseitigen Mengenverhältnisses der Kohlenhydrate im Laubblatt vom Wassergehalt. [Reciprocal relationship between carbohydrates in foliage leaves and water content.] Mez, Bot. Archiv. 5: 234–259. 1924.—Only cane sugar and hexoses take part in the production of sugar through starch hydrolysis in the wilting leaf. With the exception of a small loss due to respiration, the total addition of sugar represented the reduction in starch content. In the presence of starch the cane sugar content rises with falling, and falls with rising water content, and this is true in cut leaves whether in the dark or light. This cane sugar increase takes place independently of light; it must, therefore, be regarded as a function of the water content. The hexose content always rises in starch-containing leaves kept in the dark but reaches a higher value in the wilting leaves than in moist ones. The maltose content decreases during darkness, and more rapidly if the leaves are kept dry than if moist. These facts hold for leaves still attached to the plant as well as for detached leaves. Local tests establish the fact that in *Tropaeolum* and *Helianthus* the hexoses alone are transported. Maltose is not to be found in the petiole of *Tropaeolum* or the nerves of *Helianthus.*—*Carl Mez (transl. by William Seifriz).*

6630. Cholodny, N. Ueber einige mit der Transpiration und Wasseraufnahme verbundene elektrophysiologische Erscheinungen bei den Pflanzen. [Electro-physiological phenomena associated with transpiration and water intake.] Mez, Bot. Archiv. 5: 439–457. *19 fig.* 1924.—Increase and decrease in transpiration is accompanied by changes in the electrical potential of the leaf blade, which is greater in young leaves than in old. The roots show a much more pronounced potential change, with change in moisture, than do the leaves. The electrolytic reaction of roots due to application of dry air is always of the same character in different plants and under different conditions, and possesses a minimum and a maximum. The initial change in potential (the fall of the curve to the minimum) is due to evaporation from the root surface. The 2nd part of the reaction (the rise of the curve to the maximum) is not directly connected with air moisture but rather to the changes in water content of the cells within the roots. Narcotics and cutting off of nutrients reduce or completely eliminate the electro-physiological reactions.—*Carl Mez (transl. by William Seifriz).*

6631. Pieschel, E. Ueber die Transpiration und Wasserversorgung der Hymenomyceten. [Transpiration and imbibition of the Hymenomycetes.] Mez, Bot. Archiv. 8: 64–104. *5 fig.* 1924.—The transpiration of a fungus under different temperature and moisture conditions is approximately proportional to the saturation deficit of the air. Transpiration values of free-growing fungi were as a rule much higher than those of the same fungus growing in a closed room—probably due to air currents. Different species hold water with different degrees of tenacity. Placing most fungi in water causes a complete elimination of transpiration loss. With *Amanita* and *Lactarius* this was not the case. Special water conducting hyphae do not exist. Water intake is a capillary phenomenon.—*Carl Mez (transl. by William Seifriz.)*

6632. Clements, F. E., and J. V. G. Loftfield. The water cycle in plants. Carnegie Inst. Washington Year Book 23: 247. 1924.

6633. Dole, E. J. Studies on the effects of air temperature and relative humidity on the transpiration of Pinus Strobus. Vermont Agric. Exp. Sta. Bull. 238. *1-39.* 1924.—Experiments were carried out in an even temperature room in an apparatus which made it possible to control temperature, humidity, air current and light. The variable factors in the

experiments were air temperature and relative humidity. The author concludes that absolute transpirational losses cannot be correlated with either temperature, or with relative humidity, nor can they be correlated with the combined effect of these 2 factors as expressed in terms of vapor pressure.—*George P. Burns.*

6634. Livingston, Burton E. The water relations of plants with special reference to root absorption and transpiration as influenced by sunshine. Carnegie Inst. Washington Year Book 23: 237–238. 1924.

6635. Lode, Alfred. Beiträge zur Kenntnis der Wanderung und Anhäufung der Produkte der Kohlensäureassimilation im Laubblatte. [Translocation and storage of products of CO_2 assimilation in leaves.] Mez, Bot. Archiv 8: 449–495. 1924.—In *Iris germanica* the assimilation products pass directly from the assimilation tissue into the conductive tissue. To this class belongs also the wreath type where each vascular bundle is surrounded by a wreath of palisade cells (Gramineae, *Cyperus* spp.). In *Ricinus, Callisia*, etc., the assimilation products travel from the assimilation tissue into intermediary tissue (collective cells) and then into the conductive tissue.—*William Seifriz.*

6636. Rosenthaler, L. Die Rupp'sche Theorie des Wasser-und Gastriebes der Pflanze. [Rupp's theory of water sprouts.] Mitteil. Naturf. Ges. Bern 1924: lvi–lviii. 1925.—The author discusses Rupp's (Mitteil. Pharm.-Chem. Inst. Univ. Königsberg. August. 1917) theory in relation to water sprouts and similar shoots. which has thus far received little attention from botanists, This theory suggests a certain analogy with that of Bose in reference to the ascent of sap in plants.—*S. Blumer (translated).*

6637. Rudolph, Konrad. Epidermis und epidermale Transpiration. [Epidermis and epidermal transpiration.] Mez, Bot. Archiv 9: 49–94. *Fig. 1–24.* 1925.—Leaves of numerous species were immersed in acids and the time required to kill determined. The osmotic suction effect of the cell contents has little influence on the penetration of the solutions. Sun leaves cut and immersed in 3.7% HCl withstood the effect of the acid by retarding penetration much more readily than do shade leaves. Penetration of dyes produces in *Eschscholtzia* typical Liesegang rings. Water plants show a reduction in cell size over land seed-plants. Mosses have the smallest of all cells. Among the bryophytes, the thalloid liverworts have the largest cells, the foliose liverworts next, and the mosses the smallest.—*William Seifriz.*

MINERAL NUTRIENTS AND SALT RELATIONS

6638. Bondorff, K. A., og A. Petersen. Det kvantitative Forhold mellem Planternes Ernæring og Stofproduktion. I: Forsog med stigende Kvælstofgmængder udført i de danske Landboforeninger. [The quantitative relation between nutrition and production of matter by plants. I: Field experiments with increasing quantities of nitrogen carried out by the Danish Agricultural Associations.] K. Vet. og Landbohoejskole Aarsskr. [Copenhagen Agric. Coll. Yearbook] 1924: 187–233. *3 diagr.* 1924.—(With English summary.) The Danish Agricultural Associations have conducted nearly 1000 field experiments with crops, involving graded amounts of nitrogen. The results follow the common rule that the larger the total quantity applied per unit of area, the smaller the effect per unit of fertilizer. A dressing with nitrate of soda (Chile) shows the same effect whether or not the nitrate is given together with an application of stable-manure. Nitrate of lime (Norway) has shown a curiously slight effect compared with that of nitrate of soda (Chile). Tables are given which allow recalculation of excess yield caused by any quantity of nitrate, when the excess yield, caused by a definite quantity, is supposed to be 1000.—*Ernst Gram.*

6639. Cerighelli, R. Sur l'emploi de récipients en verre paraffiné dans les expériences de culture. [The use of paraffined glass containers in culture work.] Bull. Soc. Bot. France 71: 783–786. 1924.—Glass containers as culture vessels furnish the plant traces of mineral salts, notably of calcium. For that reason Maquenne and Demoussy, in their studies upon germination, used platinum or quartz vessels. The author suggests, instead of the costly containers just referred to, the use of a coating of paraffine in the glass vessels. The technique of preparation is explained. Such paraffined vessels were found to yield no substances influencing germination, and with such containers, as with quartz vessels, very small quantities of calcium exert a favorable action upon germination.—*J. Beauverie (translated).*

6640. Reed, H. S., and A. R. C. Haas. **Nutrient and toxic effects of certain ions on citrus and walnut trees, with especial reference to the concentration and pH of the medium.** California Agric. Exp. Sta. Tech. Paper 17. *1–75. Fig. 1–28.* 1924.—This paper is in the nature of a progress report on several series of experiments showing the growth and composition of plants grown in various culture solutions. Citrus and walnut seedlings and young trees were used. Walnut seedlings grown in Hoagland's nutrient solution with an excess of SO_4 up to 1200 parts per million made satisfactory growth, but with higher concentrations injury resulted. Nitrate in concentrations as high as 1600 p.p.m. had no injurious effect, and higher concentrations only retarded growth in the tops of the trees. Orange seedlings grown in different concentrations of the basic nutrient solution, with 500 p.p.m. NaCl added to each, absorbed the Na and Cl in the greatest degree in the series where it was added to a single strength nutrient solution. The authors conclude that within certain limits the relation of a certain ion to the concentration of the other ions will be a factor in determining the amount absorbed. The pH of the medium had little influence on the absorption. The percentage of cations in the ash showed little evidence that plants absorb relatively more cations from alkaline solutions than from acid solutions. Orange trees grown under controlled conditions in sand or soil and irrigated with water containing 1500 p.p.m. NaCl showed very definite injury, typical of salt injury in the field, Lowering of the salt content by leaching with distilled water greatly benefited the trees, but the addition of nutrient solution was necessary because of the removal of nutrients in the drainage water. Sodium bicarbonate added to a solution deficient in Ca retarded growth, brought on a chlorotic condition, and eventually killed the roots, being more toxic than either Na_2SO_4 or NaCl. High concentrations of K-ions did not cause injury at first, but did eventually. This injury was most severe in series of cultures where Ca was deficient, trees in these series showing typical "mottle leaf." Trees grown in sand, and irrigated with culture solutions deficient in Mg (54 p.p.m.) showed no great injury. A peculiar type of chlorosis appeared, but good growth was made, indicating that a relatively small amount of Mg is adequate for growth and chlorophyll production. A bibliography is given.—*Margaret Buvens.*

PHOTOSYNTHESIS

6641. Atkins, W. R. G. **The hydrogen ion concentration of sea water in its relation to photosynthetic changes. Part III.** Jour. Marine Biol. Assoc. United Kingdom n.s. **13**: 437–446. *Fig. 1–4.* 1924.—This is the 3rd of a series (see Bot. Absts. **12**, Entry 757; **13**, Entry 797) of papers under this and a slightly variant title. The author's summary is: "(1) The pH values for the L series [of stations] were noticeably lower in March, 1923, than in 1922, on account of the outflow of fresh water. The well-marked May maximum, followed by a depression in June and July, 1922, is not found in 1923, during the summer months of which the water increased in alkalinity until August, when it slowly decreased. This appears to be due to the absence of stormy and wet weather in June and July, 1923. (2) The pH values for E 1 [stations] reached their maximum at the surface in July, but the bottom values were still low. These increased till uniformity of the water column was attained in October at pH 8.18, denoting 3% less hydroxyl ion than in 1922. (3) The sunshine records for the 2 years show that 1922 had a maximum in May followed by markedly lower values after June. In 1923, August was slightly above May, and the distribution before and after midsummer was more nearly equal."—*Marshall A. Howe.*

6642. Baggesgaard-Rasmussen, H. **Nogle nyere Arbejder over Kulsyreassimilationen. [Recent work on carbon dioxide assimilation.]** Nat. Verden **7**: 270–276. *3 diagr.* 1923.—This is a review of the work of the Wilstätter school, Stoll, Moon, and Webster.—*Ernst Gram.*

6643. Dastur, R. H. **Water content, a factor in photosynthesis.** Ann. Bot. **38**: 779–788. *1 fig.* 1924.—The decline in photosynthetic activity of leaves first appears at the margins and in regions farthest from veins, and gradually proceeds inwards towards the center and the main veins. Since these are the regions most unfavorably placed with respect to the water-supply, it is concluded that the decline in photosynthesis is due to shortage of water. This may be caused in 2 ways. (1) The increased size of the leaf with growth causes an increased amount of photosynthesis and transpiration, but the specific conductivity of

the tracheids remains unchanged. (2) The increasing number of new leaves at the apex causes a greater pull on the water in the axis while that in the old leaf remains the same. Differences in water content account for the variable values of the assimilation numbers found by Willstätter and Stoll for leaves of different plants and of the same plant at different times.—*W. P. Thompson.*

6644. Inamdar, R. S. **"The law of constants and the law of product in physiology."—A critical note.** Jour. Indian Bot. Soc. 4: 180 186. 1924.—This is a criticism of certain portions of the book, "The physiology of photosynthesis" by J. C. Bose.—*F. E. Denny.*

6645. Pütter, A. **Der Umfang der Köhlensaurereduktion durch die Planktonalgen. [The reduction of carbon dioxide by plankton algae.]** Pflüger's Archiv Ges. Physiol. Menschen u. Tiere 205: 293–312. 1924.—In summer the plankton algae in the harbor at Kiel at the surface average by reduction of carbon dioxide 2.43± 0.07 mg. of oxygen freed per liter of water. This corresponds to the production of 34 gm. of sugar per day per sq. m. of surface with the average depth of 15 m. The average production of oxygen for 1 sq. m. per hour is 250± 50 mg. Since the reduction of carbon dioxide occurs only during the hours of light the actual value should be considered 388–435 mg. per hour. The production of organic substances by algae is important by reason of the complete dependence of heterotropic marine organisms on them. By correlation methods it was determined that the assimilation by the algae was of the same order of magnitude at 25 m. depth in the tropical Atlantic as at Kiel. At 50–80 m. there is yet a distinct influence exerted by the algae on the carbon dioxide content of the water but at 100 m. and deeper this is absent.—*Wm. Randolph Taylor.*

6646. Schmidt, A. **Über die Chlorophyllbildung im Koniferenembryo. [Chlorophyll formation in conifer embryos.]** Mez, Bot. Archiv 5: 260–282. 1924.—The author summarizes this very interesting and theoretically significant work as follows: (1) For the investigation of conifer seedlings as to their varying ability to form chlorophyll in darkness, only such seed are suitable whose embyros are completely colorless. (2) The conditions for germination are the same as for chlorophyll formation—water, oxygen, warmth are necessary. (3) Other conditions brought to bear on the conifer seed influence chlorophyll formation only indirectly through their action on germination. (4) The conditions for chlorophyll formation are removed by the extirpation of the embryo from the endosperm; this gives complete etiolation. (5) Etiolated seedlings behave like those plants which form chlorophyll only in the light. (6) The smallest amount of endosperm clinging to the radicle enables the seedling to form chlorophyll in the dark. (7) Washing 24 hours in spring water is sufficient to induce the formation and translocation of the chlorophyll-building agent. (8) The chlorophyll formation takes place if any part of the tissue of the embryo remains in contact with the endosperm, or if artificially removed embryos are again placed in endosperm. For this purpose other species of pine can furnish the endosperm needed for chlorophyll formation. (9) The conditions for chlorophyll formation in the conifer embryo are independent of the developmental stage of the embryo or of the endosperm. (10) Dead endosperm does not fulfill the conditions for chlorophyll formation in the embryo. (11) The chlorophyll of seedlings germinating in darkness and in light shows the same spectroscopic characters.—From these investigations it follows that there must be present in conifer seedlings, residing in the endosperm, a chemical substance which will be called the chlorophyll-agent and which is able to replace light as the active factor in chlorophyll formation.—*Carl Mez (transl. by Ernst Artschwager).*

6647. Spoehr, H. A., and J. M. McGee. **Absorption of carbon dioxide by leaf material.** Carnegie Inst. Washington Year Book 23: 132–133. 1924.

6648. Trumpf, Chr. **Ueber den Einfluss intermittierender Belichtung auf das Etiolement der Pflanzen. [The effect of intermittent light on etiolation.]** Mez, Bot. Archiv. 5: 381–410. *3 fig.* 1924.—The particular cause of etiolation is light scarcity. Scarcity of chlorophyll production and of CO_2 assimilation do not stand in a causal relationship to etiolation. The position of the plant between the extreme states of etiolation and normal light habit is dependent upon a definite light quantity, from which results the product law (intensity times time = constant), that is, light perception follows the fundamental law of photochemistry. Growth periods are dependent upon light and temperature. Red and blue light

affect growth in opposite ways. Red light affects the leaves like weak white light, and affects the internodes like darkness; while blue light affects the leaves like darkness and the internodes like weak white light; this means that red light accelerates growth of all organs in contrast to blue light. There is no correlation between internode length and leaf size. A carrying over of the light stimulus from one organ to another could not be established, although there is such a transfer from one region of an organ to other parts of the same organ. —*Carl Mez* (*transl. by William Seifriz*).

METABOLISM (GENERAL)

6649. Clifford, Percy Herbert. **"Oxycellulose": its formation and reactions. A summary of the literature.** (The British Cotton Industry Res. Assoc.) Jour. Textile Inst. 13: T 189–204. 1922.—The discussion covers methods of oxidation; and reactions of, and tests for oxycellulose.—A bibliography of 90 titles is appended.—*Frederick V. Rand.*

6650. Colin, H., and R. Franquet. **Greffes d'Helianthus à inuline sur Soleil annuel et sur diverses Composées.** [**Grafts of species of Helianthus containing inulin upon the annual sunflower and upon other Compositae.**] Bull. Mus. Hist. Nat. [Paris] 29: 119–121. 1923.—*Helianthus orgyalis* and *H. trachelifolius*, both rich in inulin, were grafted on *H. annuus*, and in neither case was the least trace of inulin found to be transferred to the stock so treated. When *H. multiflorus* was grafted upon *H. annuus*, however, there was an exchange of inulin which was rapidly converted to levulose and utilized by the stock. The difficult experiment of grafting 2 genera of Compositae was successfully performed, *H. strumosus* being grafted upon *Artemisia absinthium*, but here again there was no exchange of the elaborated materials. —*John M. Fogg, Jr.*

6651. Coward, Hubert Frank, and Gladys Mary Wigley. **The detection and estimation of acidity and alkalinity in cotton fabrics.** Jour. Textile Inst. 13: T 121–126. 1922.—It was found that "acidimetry (correct to 0.01% HCl or H_2SO_4) and alkalimetry (correct to 0.02% NaOH, present as Na_2CO_3) of bleached cotton cloth can be accurately carried out by titrations with N/50 solutions, at the boiling point in the presence of the fabric, with phenolphthalein as indicator. . . . Colored indicators of suitable strength can be used for the approximate estimation of acidity and alkalinity of fabric by 'spotting' on the fabric."—Details are given.—*Frederick V. Rand.*

6652. Fargher, Robert George. **The chemical constituents of raw cotton.** British Cotton Indust. Res. Assoc.) Jour. Textile Inst. 13: T 1–16. 1922.—After an historical introduction the author takes up the subject under the following headings: General differentiation; proximate analyses; extraction with solvents; the wax of cotton; the ash of cotton; the proteins of cotton; pectic material; coloring matters; cellulose; and behavior of the minor constituents of raw cotton in technical operations.—A bibliography of 108 titles is added.—*Frederick V. Rand.*

6653. Franzen, Hartwig, and Ernst Keyssner. **Über die chemischen Bestandteile grüner Pflanzen. XXIX Mitteilung. Über einige wasserlösliche Bestandteile der Blätter der Brombeere (Rubus fruticosus).** [**Water soluble constituents of the leaves of the blackberry.**] Zeitschr. Physiol. Chem. 129: 309–319. 1923.—Lactic acid 0.8%, succinic acid 0.009%, malic acid 0.00015% and oxalic acid 0.0003% of the dry weight of leaves were found. —*H. R. Kraybill.*

6654. Javillier, M., P. Baude, et S. Levy-LaJeunessee. **Essais d'identification du facteur A. Le facteur A et le phytol.** [**Attempts to identify vitamin A. Vitamine A and phytol.**] Bull. Soc. Chim. Biol. 7: 39–51. 1925.—An alcoholic extract of the leaves of Urtica sp. and the unsaponifiable fraction of such an extract were equally potent in preventing and curing avitaminosis (for vitamin A) in the white rat. Phytol was prepared from the dried leaves by isolating and saponifying phytophytin, and purifying the product by the method of Willstätter. The purified phytol gave no protection; impure preparations containing carotin gave some temporary protection. As pure carotin is inactive, this is due to the tenacity with which factor A clings to carotin.—*Joseph S. Caldwell.*

6655. Kalff, Jan, and Robert Robinson. **A synthesis of myricetin and of a galangin monomethyl ether occurring in Galanga root.** Jour. Chem. Soc. [London] 127: 181–184. 1925.

—The authors report in detail the synthesis of a flavone "which is identical with the galangin monomethyl ester isolated from galanga root, the rhizome of *Alpinia officinarum* Hance."—*F. E. Denny.*

6656. Knecht, Edmund, and Eva Hibbert. **A direct method for the estimation of glucose and other carbohydrates.** Jour. Chem. Soc. [London] 125: 2009–2012. 1924.—The reaction between various sugars and phenyl-hydrazine in forming osazones was found to be quantitative when the mount of phenylhydrazine is in great excess. The osazone formed could be titrated directly, without being isolated, by the use of standard titanous chloride. About 20 minutes were required for a complete estimation. Maltose and lactose form osazones directly but sucrose must first be hydrolyzed. A study is being made with reference to the use of this method in the estimation of the products of hydrolysis of complex carbohydrates. *F. E. Denny.*

6657. Mockeridge, Florence A. **The formation of plant growth-promoting substances by micro-organisms.** Ann. Bot. 38: 723–733. 1924.—The effect of varying quantities of nucleic acid derivatives on the growth of *Lemna minor* was investigated and it was found that the effect obtained was approximately proportional to the quantity of material supplied. Similarly, an examination was made of the effect of varying proportions of a sterilized culture of *Azotobacter*, as a result of which it appears that the effect, though increasing with the quantity of the organism supplied, is not proportional to it. Both autolysed and autoclaved yeast were found to have plant growth-promoting power, the autoclaved material being more effective than the autolyzed. All materials so far investigated and found to have this effect on plant growth contain purine and pyrimidine bases.—*M. Newton.*

6658. Pratt, Clara A. **The staling of fungal cultures. II. The alkaline metabolic products and their effect on the growth of fungal spores.** Ann. Bot. 38: 599–615. *1 fig.* 1924. —The alkaline metabolic products of *Fusarium* are discussed. The origin of the alkalinity developed by cultures of *Fusarium* on Richard's solution is shown to be caused by the KNO_3 present, but the poor growth of Botrytis spores in an acidified stale medium is thought to be due to simple organic acids which are liberated by the acidification. When, however, the medium is made alkaline, the organic acid radicals do not reduce the growth of Botrytis spores. They cannot, therefore, act as staling agents in an alkaline stale medium. A considerable amount of bicarbonate and a small amount of carbonate are present in the stale medium. It is suggested that staling is due to the formation of bicarbonate by the CO_2 of respiration whenever the medium is such that a basic radical is set free.—*M. Newton.*

6659. Pratt, David Doig, and Robert Robinson. **A synthesis of pyrylium salts of anthocyanidin type. Part V. The synthesis of cyanidin chloride and of delphinidin chloride.** Jour. Chem. Soc. [London] 127: 166–175. 1925.

6660. Spoehr, H. A. **Oxidation of carbohydrates with air.** Carnegie Inst. Washington Year Book 23: 134–135. 1924.

6661. Spoehr, H. A., and A. P. Locke. **Attempts to effect an asymmetric carbohydrate synthesis.** Carnegie Inst. Washington Year Book 23: 132. 1924.

6662. Ziegenspeck, H. **Ueber einen stärkeähnlichen löslichen Stoff im Fruchtknoten von Bromeliaceen.** [A starch-like substance in the ovary of the Bromeliacea.] Mez, Bot. Archiv. 8: 303–304. 1924.—In the ovaries of different Bromeliaceae were found cells whose contents stained with iodine. These bodies are possibly polysaccharides of amylodextrin-like structure, that is, a coarse hydrosol which cannot pass the cell membrane.—*Carl Mez (transl. by William Seifriz).*

6663. Ziegenspeck, H. **Ueber Zwischenprodukte des Aufbaues von Kohlenhydrat-Zellwänden und deren mechanische Eigenschaften.** [Intermediate products in the building up of carbohydrate cell walls and their mechanical properties.] Mez, Bot. Archiv. 9: 297–376. *Pl. 1–23, fig. 1–14.* 1925.—Single refractive amyloid, doubly refractive amyloid, callose, and cellulose are intermediate products in cell wall production in the order named. While usually only temporary products, these may remain permanently, 1st, because of the ease with which they are handled metabolically (in tracheal partition walls and as reserve substances); and 2nd, because of their high stretching capacity. The mechanical advantage to the cell in growth, of the amyloid constituents is apparent, 1st, in active growth due to turgor in

which the cell is stretched from within (root hairs, *Nuphar* intercellular spaces, amyloid caps, swelling tissue), and 2nd, in passive growth in which the cell is expanded by external forces (collenchyma, sieve parts, etc.).—*Carl Mez (transl. by William Seifriz).*

METABOLISM (NITROGEN RELATIONS)

6664. Henley, R. R. **Observations on the mechanism of the reaction between formaldehyde and serum proteins.** Jour. Agric. Res. 29: 471–482. 1924.—The study of the mechanism of the reactions by which the more soluble serum proteins are converted into less soluble forms was directed chiefly along the following lines. (1) the order of the reactions, (2) the effect of temperature on the velocity of the reactions, and (3) the changes in the titrable acidity of the formolized serums. The results obtained indicated that the reaction was of the bimolecular order and that the temperature coefficient was 3. The titratable acidity of formolized serums was found 1st to increase and then decrease. The decrease continued in some instances until the formolized serum was more alkaline than the original serum. A comparison was made between the mechanism of the reactions concerned in heat coagulations and formol gelation. The suggestion is advanced that formol-gelation is due to polymerization.—*Author.*

6665. Osborne, T. B., and L. B. Mendel. **Continuation and extension of work on vegetable proteins.** Carnegie Inst. Washington Year Book 23: 286–290. 1924.

METABOLISM (ENZYMES, FERMENTATION)

6666. Bridel, Marc. **Sur hydrolyse fermentaire du gentiacauloside (gentiacauline). [The enzymic hydrolysis of gentiacauloside.]** Bull. Soc. Chim. Biol. 7: 31–38. 1925.—Gentiacauloside was isolated by the author in 1914 from *Gentiana acaulis*. It was split by acid hydrolysis into gentiacauleol, which appears to belong to the flavone series, with glucose and xylose. It has now been determined that glucose and xylose do not exist separately in the molecule, but are combined as xyloglucose, which has been obtained in crystalline form. It is split off from the glucoside by the action of enzymes present in the seed of *Rhamnus utilis* or in the entire plant of *Monotropa hypopitys*. In so far as the properties are known it agrees with the xyloside of glucose which was isolated from *Primula officinalis* Jacq. by Goris, Mascrè and Vischniac, and by them named primeverose, but these properties are too imperfectly known to permit absolute certainty. (See following Entry.)—*Joseph S. Caldwell.*

6667. Bridel, Marc. **Sur l'hydrolyse fermentaire du monotropitoside (Monotropitine.) [The enzymic hydrolysis of monotropitine.]** Bull. Soc. Chim. Biol. 7: 52–57. 1925.—In earlier communications (see Bot. Absts. 13, Entry 5387; 14, Entries 666, 1785, 1786) the author has described the isolation of a glucoside, monotropitine, yielding methyl salicylate from *Monotropa hypopitys*, fresh bark of *Betula lenta*, and fresh roots of 3 species of *Spiraea*. He has now studied the glucoside from *Betula* in detail, finding that it is hydrolyzed by an enzyme extract of *Monotropa hypopitys* to yield methyl salicylate and primeverose, which is a xyloglucose yielding xylose and glucose in equimolecular proportions. It is identical in every respect with the xyloglucose obtained by hydrolysis of the glucoside of *Gentiana acaulis* (see preceding Entry). Work which the author has in progress indicates that the occurrence of this xyloglucose, which he names primeverose, may be quite general.—*Joseph S. Caldwell.*

6668. Euler, Hans von, und Karl Myrbäck. **Gärungs-Co-Enzyme (Co-Zymase) der Hefe I. [Co-zymase of yeast.]** Zeitschr. Physiol. Chem. 131: 179–203. 1923.—Crude preparations of Co-zymase were made by boiling yeast and filtering. Purer preparations were obtained by fractional precipitation of the yeast extracts with ethyl alcohol or methyl acetate. The optimum pH for zymase fermentation is 6.2–6.8. Co-zymase diffuses through collodion and is not identical with vitamin D.—*H. R. Kraybill.*

6669. Girard, Pierre. **Les processus biochemiques d'oxydation et de reduction et l'activation catalytique. [Biochemical oxidation, reduction, and catalytic activation.]** Bull. Soc. Chim. Biol. 7: 75–96. 1925.—A lecture on this topic was delivered before a joint meeting of the French Societies for Physical Chemistry and Biological Chemistry. In this some of the more important work is reviewed.—*Joseph S. Caldwell.*

6670. Helferich, Burckhardt, Paul Elias Speidel, und Walter Toeldte. **Über Emulsin. II Mitteilung.** [**Emulsin. II.**] Zeitschr. Physiol. Chem. **128**: 99–108. 1923.—Preparations of emulsin were made by use of ultra filters. Pepsin retarded the action of emulsin on salicin. The harmful action of methyl alcohol on salicinase is probably due to methylation.—*H. R. Kraybill.*

6671. Kuhn, Richard. **Vergleich von Hefe- und Taka-saccharase. Fünfte Mitteilung über Spezifität der Enzyme von Richard Willstätter und Richard Kuhn.** [Comparison of yeast and Taka-saccharase.] Zeitschr. Physiol. Chem. 129: 57–63. 1923.—B-glucose and fructose retard the action of yeast saccharase but not that of Taka-saccharase, while glucose retards the action of Taka-diastase but not that of yeast saccharase. Taka-saccharase is therefore a "glucosaccharase" and yeast saccharase a "fructo-saccharase."—*H. R. Kraybill.*

6672. Lecoq, Raoul. **Variabilite de l'optimum de température favorisant l'action des ferments amylolytiques de l'orge germée sur les amylacés cuits et crus.** [Variations in optimum temperature for action of the amyloclastic enzymes of barley malt on raw and cooked starches.] Bull. Soc. Chim. Biol. **7**: 26–30. 1925.—Maximum formation of reducing sugar by the enzymes of ground malt, employed as the ground flour, occurs with raw wheat or potato starch at 75°, with these starches in the cooked state at 60°. With barley starch, raw or cooked, the optimum temperature for activity is 75°. When malt extract concentrated to a paste was used instead of ground malt, maximum sugar formation with the raw starches named occurred at 60°; with the cooked starches, at 50°. With an extract dried in the form of fine scales the optimum temperature was 70° for raw wheat and potato starch, and there was no appreciable action upon cooked starches. No hypothesis to account for these facts is offered.—*Joseph S. Caldwell.*

6673. Mitchell, Stotherd. **Hydrolysis of the d-glucosides of d- and l-borneol with emulsin.** Jour. Chem. Soc. [London] **127**: 208–209. 1925.—From his experimental results the author concludes that emulsin hydrolyses l-bornyl-d-glucoside 3–4 times as rapidly as d-bornyl-d-glucoside. This is a striking example of the selective nature of enzyme action. —*F. E. Denny.*

6674. Sherman, H. C. **Chemical investigation of the amylases and related enzymes.** Carnegie Inst. Washington Year Book **23**: 243–245. 1924.

6675. Willstätter, Richard, Richard Kuhn, and Harry Sobatka. **Über die einheitliche Natur der β-Glucosidase des Emulsins. Vierte Mitteilung über Spezifität der Enzyme von Richard Willstätter und Richard Kuhn.** [**The individual nature of β-glucosidase of emulsin.**] Zeitschr. Physiol. Chem. **129**: 33–56. 1923.—From a study of the velocities of hydrolysis of various glucosides by different emulsin preparations the conclusion is drawn that there is only one β-glucosidase in emulsin.—*H. R. Kraybill.*

GROWTH, DEVELOPMENT, REPRODUCTION

6676. Bondorff, K. A. **Det kvantitative Forhold mellem Planternes Ernæring of Stofproduktion. II: Matematiske Udtryk for Udbyttekurven.** [**The quantitative relation between nutrition and production of matter by plants. II: The mathematical expression of the production curve.**] (With French summary.) K. Vet. og Landbohoejskole Aarsskr. (Copenhagen Agric. Coll. Yearbook] **1924**: 293–336. *Fig. 1–16.* 1924.—The regularity of the curve for yield, when a single nutritive factor is varying, has tempted several authors into formulation of mathematical equations which are critically reviewed in the present paper. The following equation is constructed, $y = k\,z^p - c\,z^n$, in which y is the quantity of matter produced, z the absorbed quantity of the nutritive element, and c, k, n, and p constants. The equation expresses yield as determined by the difference between the nutritive and the toxic action of the nutritive element. The quantity absorbed by a plant of a water-soluble element is absolutely proportional to the amount placed at the disposal of the plant. For insoluble compounds, such as certain calcium phosphates, no simple proportionality exists. The equation given above seems also useful for the expression of temperature and water relations. —*Ernst Gram.*

6677. Cannon, W. A. **Root-growth in cotton under normal conditions of temperature and oxygen-supply.** Carnegie Inst. Washington Year Book **23**: 137–138. 1924.

6678. Grau, Fritz. **Gesetzmässigkeiten der Standweite und Bestockung.** [Principles relating to distance of stand and tillering.] Mez, Bot. Archiv. 9: 386–397. 1924.—The author summarizes his results as follows: (1) The relation of tillering of cereal varieties to distance of stand, according to the law of phytophysiological relations is expressed by the formula, $y = A\ (1 - e_e^{c \cdot x})$, in which y = average tillering; e = distance of stand; A = maximum tillering and x = the responsible factor.—The responsible factor c in one and the same soil has the same value, and this value is 0.01; in different soil types it varies and depends in its size upon the physico-chemical character of the soil, that is, the tillering of cereal plants differs for every soil type.—The culm diameter in all cereal varieties follows the working law of growth factors; the same is true for yield of straw. In as far as careful experiments showed, this relation was also demonstrated for the grain yield.—*Carl Mez (transl. by F. V. Rand).*

6679. MacDougal, D. T. **Growth in cacti.** Carnegie Inst. Washington Year Book 23: 126–127. 1924.

6680. Reese, Emil. **Stecklingvermehrung unter Kohlsäuredüngung in einer Staudengärtnerii.** [Propagation of cuttings under the influence of added CO_2.] Möllers Deutsch. Gärtnerzeitg. 40: 25–26. 1925.—The apparatus of C. Gerhardt in Bonn was used in a greenhouse. Using cuttings of *Chrysanthemum*, made in the ordinary way, the gassed cuttings were rooted in 2–3 weeks, whereas the control cuttings were slower. A similar contrast was obtained with Dahlia cuttings. Leaves of gassed seedlings of *Aconitum Wilsoni* were 3 times as large as the untreated plants. The writer recommends the use of added CO_2 in order to obtain better plants from cuttings.—*J. C. Th. Uphof.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

6681. Goldsmith, G. W., and Lee Bonar. **Further studies in flower movement.** Carnegie Inst. Washington Year Book 23: 249–250. 1924.

6682. Schaede, R. **Umkehr-Versuche mit Cacteen.** [Reversibility experiments with Cactaceae.] Mez, Bot. Archiv. 5: 70–74, 471. *2 fig.* 1924.—Reversibility experiments were carried out in which it was shown that species of *Phyllocactus* respond with extreme slowness to gravitational stimuli but with great rapidity to phototropic stimuli.—The Cactaceae investigated are good examples of plants with non-reversibility of polarity.—*Carl Mez (transl. by F. V. Rand).*

6683. Zeidler, Julie. **Beiträge zur Frage des Galvanotropismus der Wurzeln.** [The galvanotropism of roots.] Mez, Bot. Archiv 9: 157–193. *Fig. 1–25.* 1925.—Roots were allowed to grow suspended between 2 electrodes in an electrolytic solution. Negative and positive galvanotropisms were observed depending on the strength of current used. A very pronounced polarity in injury was evident in that the anode side of the root was damaged. This polarity extends to the individual cells in that the nuclei show a marked polarity due to treatment, which is not true of the cytoplasm. A brief subjection to the current was sufficient for the nuclei to show polarity which consists in a migration of nuclear granules toward the anode. This is believed to be due to, 1st, a flocculation which is the result of a change in electrical charge of the colloidal constituents of the nucleus, and subsequently the piling up of these particles at the anode side of the nucleus. The fact that the cytoplasm shows no such polarity may mean that the isoelectric point of the cytoplasm is different from that of the nuclear substance, that the nuclear substance is more readily precipitated at the isoelectric point, or that the nuclear membrane is in some way responsible for the difference in behavior.—*William Seifriz.*

GERMINATION, RENEWAL OF ACTIVITY

6684. Hesse, O. **Untersuchungen über die Einwirkung chemischer Stoffe auf die Keimung lichtempfindlicher Samen.** [The effect of reagents on the germination of light sensitive seed.] Mez, Bot. Archiv 5: 135–171. 1924.—In the germination of light sensitive seed, 2 groups are distinguishable. The N type of Gassner includes those which can only germinate in the dark through the aid of N compounds. The second group is the facultative N type which includes those seed which profit not only from the N compounds but also from the N-free HCl and H_2SO_4. With establishment of the fact that acidity plays a subordinate

part in germination of light-sensitive seed the theory of Lehmann, that the acids act as catalysts on reserve foods within the seed and that light plays a similar part, loses much of its weight. Ethyl alcohol is also a stimulant to germination. Concentrated solutions of it do not harm the seed. This all goes to prove that the effect on germination of reagents is not upon the inner substance of the seed but merely upon the seed coat.—*Carl Mez* (*transl. by William Seifriz*).

6685. Stechmann, Rudolf. **Untersuchungen über Keimschwankungen einiger Gräser und ihre Bedeutung für die praktische Samenprüfung.** [Germination of grasses.] Mez, Bot. Archiv **9**: 243–293. 1925.—*Cynosurus cristatus*, *Lolium perenne* and *Poa pratensis* toward the end of winter and in spring first reach their maximum germination capacity. The power of germination of seed of different species makes it clear that this property rests upon many complex physiological reactions which do not follow the same course in every case.—*William Seifriz.*

6686. Weissflog, J. **Leben und Lebensdauer in den Reservestoffbehältern keimender Samen.** [Viability and longevity in the storage organs of germinating seed.] Mez, Bot. Archiv **5**: 283–312. 1924.—The author summarizes his results as follows: (1) The dried out, starch-containing, storage-tissue cells in the ripe seed of Gramineae and Commelinaceae, as well as in *Fagopyrum*, *Mirabilis*, and *Agrostemma*, are dead. On the contrary, this is not true in *Anthurium Kellermanni*. (2) The cells of those storage tissues which contain proteins and fat are living, as also are those rich in hemicelluloses.—(3) In addition to the Gramineae and *Fagopyrum*, the Commelinaceae also possess an aleurone layer of living cells.—(4) The reserve material has more or less completely disappeared from the dying cells of the formerly living storage-organs (endosperm, cotyledons).—(5) In seed with living storage-tissue there is a connection between the behavior of the embryo and the longevity of the storage tissue cells during germination. Two types are noted. In one type the storage cells around the absorbing organ of the embryo (haustoria or cotyledons) die early in germination, and simultaneously the absorbing organ grows within the storage tissue. In the 2nd type the storage-tissue cells remain alive for a long time and the absorbing organ does not increase in size.—(6) In type 1, fats and proteins are, in the main, mobilized from living storage cells; to a slight extent they can also be removed from dead cells. Hemicelluloses in this type are mainly removed from the walls of dead cells; nevertheless, except in *Phoenix*, the walls of living storage cells also show appearances of dissolution.—*Carl Mez* (*transl. by F. V. Rand*).

REGENERATION, CORRELATION

6687. Clements, F. E. **Competition and correlation in the plant body.** Carnegie Inst. Washington Year Book **23**: 250–251. 1924.

RADIANT ENERGY RELATIONS

6688. Barr, C. E., and W. T. Bovie. **Ultraviolet cytolysis of protoplasm.** Jour. Morphol. **38**: 294–300. *Fig. 1.* 1923.—Using ultraviolet light with wave length of 2800 Å units, amoebas on quartz slides under quartz cover glasses were exposed for various periods of time. An exposure of $\frac{1}{2}$ to $\frac{3}{4}$ of a second caused the cells to cease movement, and 1 second sufficed to kill the cells. If the exposure stops at this point cytolysis does not become visible until a minute or more has elapsed, but if the exposure is continuous, cytolysis is evident after 3 seconds. The cell swells, active diffusion currents appear, and the protoplasm clumps into a large mass showing Brownian movement. The author believes that the cytolysis is due to the "breaking down of an organization which has its origin on the interfaces of the protoplasm."—*Ernst A. Bessey.*

TOXIC AGENTS

6689. Puri, Amur Nath. **Effect of methyl and ethyl alcohol on the growth of barley plants.** Ann. Bot. **38**: 745–752. *3 fig.* 1924.—Barley plants are killed in ethyl alcohol in concentrations of 1:1000 of nutrient solution or higher, whereas they grow in concentrations of methyl alcohol up to 1:200, though at the higher concentrations growth is stunted.

Ethyl alcohol favors growth of ears and suppression of leaves at the higher concentrations, whereas methyl alcohol favors growth of leaves and not that of ears. The toxic action of ethyl alcohol is much greater in early life than at later stages.—*W. P. Thompson.*

MISCELLANEOUS

6690. Milligan, Arthur George. **A trustworthy shaking machine.** Jour. Chem. Soc. [London] **125**: 2674–2675. *1 fig.* 1924.—A good description is given of a shaking machine which overcomes the severe strain of stopping and reversing the shaker at each end of the stroke.—*F. E. Denny.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 6042, 6138, 6140, 6207, 6215, 6218, 6296, 6378, 6399, 6408, 6433, 6602)

GENERAL

6691. Anonymous. [Rev. of: Bentham, George. **Handbook of the British Flora: a description of the flowering plants and ferns indigenous to or naturalized in the British Isles; for the use of beginners and amateurs.** 7th ed. rev. by A. B. Rendle. *lxi + 606 p.* L. Reeve & Co.; London, 1924.] Nature **114**: 379. 1924.—The reviewer notes many improvements in this edition but regrets the retention of such broad specific limits.—*O. A. Stevens.*

6692. Chen, Ming Shu. [**Treatise on Chinese botanical classification.**] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] **8**: 1204–1215. 1923.—The author suggests many new additional plant families which should be put in the Chinese classification of plants.—*Chunjen C. Chen.*

6693. Herrmann. [Rev. of: Hegi, Gustav. **Illustrierte Flora von Mittel-Europa. (Illustrated flora of Central Europe.)** Vol. 5, Part 1, Sections 64–66. J. F. Lehmann: München, 1924.] Deutsch. Forstzeitg. **40**: 85–86. 1925.—Hegi pays more attention than other authors dealing with this subject, to the morphological and biological characteristics of the individual species and genera.—*W. N. Sparhawk.*

6694. House, Homer D. **Annotated list of the ferns and flowering plants of New York State.** New York State Mus. Bull. 254. *759 p.* 1924.—This bulletin contains an extended, annotated list of the ferns, fern allies, and flowering plants of New York State. Very full synonymy is given, especially where the names are at variance with those in standard manuals of the region concerned. Habitats are given, distribution is indicated, and numerous exsiccatae are frequently cited. This list includes approximately 2876 species and numerous varieties, of which about 90 are ferns and fern allies, 23 are gymnosperms, 816 are monocotyledones and 1947 are dicotyledones.—*C. E. Kobuski.*

6695. Muenscher, W. C. **Keys to woody plants.** *64 p.* Cornell Publications Printing Co.: Ithaca, New York, 1922.—The purpose of this booklet is to aid the beginner to identify woody plants in the summer and winter condition. The keys are based upon the common native species and a few commonly planted exotics of the northeastern U. S. A. The subject is treated under the following headings: (1) A summer key to genera—based upon leaves, twigs, and fruits. (2) A winter key to genera—based upon buds, twigs, and bark. (3) Winter keys to species—based upon buds, twigs and bark. (4) A systematic list of all species included in the keys. The families and genera follow the arrangement of Engler and Prantl. The nomenclature used is in accord with the "International Code." Scientific names and common names are given. (5) A list of some publications on woody plants. (6) A glossary. —*Autl*[illegible].

6696. Schinz, Hans, und Albert Thellung. **Beiträge zur Kenntnis der Schweizerflora XX. We**[illegible] **Beiträge zur Nomenklatur der Schweizerflora IX. [Contributions to a knowledge of the Swiss flora XX. Further contributions to the nomenclature of the Swiss flora IX.]**

Vierteljahrsschr. Naturforsch. Ges. Zürich 69: 172–190. 1924.—The authors consider the article by T. A. Sprague (Jour. Bot. 62: 41–47. 1924) on "Tautonyms, nomina abortiva, and homonyms" and the effect the adoption of the principles would have on the names of Swiss plants. They take the stand that definitely determined principles of the International Rules of Botanical Nomenclature as they now stand should not be disturbed but that changes should be confined to additions and clearer definition. In an appendix the report on nomenclature to the Imperial Botanic Conference by James Britten, J. Ramsbottom, T. A. Sprague, E. M. Wakefield and A. J. Wilmott (Jour. Bot. 62: 79–81. 1924) is briefly considered.—*John H. Schaffner.*

PTERIDOPHYTES

6697. Dégen, Árpad. **A Notholaena Marantae (L.) R. Br. felfedezése a Balaton mellékén.** [**Discovery of Notholaena Marantae in the district of Lake Balaton.**] Bot. Zözlemények 19: 105–109. 1921.—This fern was discovered in 1901 on cliffs of the Szentgyörgy Mountains near Tapolca. The discovery was confirmed by specimens collected in 1912. A discussion is also given on the relation of *Notholaena* to *Cheilanthes.*—*Gy. de Istvanffi.*

6698. Ellen, Sister M. **Some ferns of southwestern Wisconsin.** Trans. Wisconsin Acad. Sci. 21: 249–250. 1924.—The writer gives a list of the ferns found in the vicinity of Sinsinawa Mound, Wisconsin, with their habitats.—*E. L. Fisk.*

6699. Holttum, R. E. **New records of species of Lycopodium for the Malay Peninsula.** Gard. Bull. Straits Settlements 3: 291. 1924.—The following species are recorded: *L. clavatum* L. var. *divaricatum* (Wall.), *L. verticillatum* L. f., *L. hippuris* Desv.—*R. E. Holttum.*

6700. Holttum, R. E. **The common ferns of Singapore.** Singapore Nat. 4. 66–76. 1924.—Notes are given on 35 common local species, as regards form and habitat.—*R. E. Holttum.*

6701. Kümmerle, J. B. **Asplenium Bornmülleri Kümm. spec. nov.** Bot. Közlemények 19: 81–83. *1 fig.* 1921.—*Asplenium Bornmülleri* is described and illustrated as a new species from Macedonia.—*Gy. de Istvanffi.*

6702. Литвинов, Д. [Litvinov, D. J.] **Augmentum indicis pteridophytorum Turkestaniae rossicae.** [**Additions to the list of pteriodphytes in Russian Turkestan.**] Ботанические Материалы Гербария Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Herb. Hort. Bot. Petropolitani] 5: 1–3. 1924.—The following pteridophytes are reported from Russian Turkestan: *Ophioglossum vulgatum* L., *Dryopteris fragrans* (L.) Schott., *Woodsia alpina* Gray, *Lycopodium annotinum* L., *L. alpinum* L., and *L. Selago* L.—*V. Lashevsky.*

6703. Pitcher, F. **In the Strathbogie Ranges.** Victoria Nat. 41: 100–102. 1924.—This brief review mentions the more notable ferns of the area, and also a few other plants.—*Wm. Randolph Taylor.*

SPERMATOPHYTES

6704. Ames, Oakes, and Charles Schweinfurth. **New or noteworthy species of orchids from the American tropics.** Schedulae Orchidianae No. 8. *P. 1–84. Pl. 21–24, fig. 1–7.* March 7, 1925.—The present paper contains critical notes on several previously published species of orchids and descriptions of the following new species: *Vanilla latisegmenta, Spiranthes subpandurata, Stenorrhynchus bracteosus, Cranichis grandiflora, Ponthieva unguiculata, Malaxis pusilla, Physosiphon minutiflorus, P. obliquipetalus, Stelis Alfaroi, S. carnosiflora, S. elliptica, S. fractiflexa, S. minutiflora, Restrepia filamentosa, Pleurothallis acrisepala, P. angusta, P. crassilabia, P. decipiens, P. longipedicellata, P. nana, P. parvula, P. rectipetala, P. segregatifolia, P. spectabilis, Lepanthes exasperata, L. ovata, L. subdimidiata, Hexisea sigmoidea, Epidendrum adnatum, E. dentiferum, E. dolabrilobum, E. erosum, E. integrilabium, E. nervosiflorum, E. ramosissimum, E. reflexum, Elleanthus tricallosus, E. trilobatus, Sobralia mucronata, Maxillaria albiflora, M. confusa, M. diuturna, M. foliosa, M. longipetiolata, M. parvilabia, M. semiorbicularis, M. vagans, Ornithidium conduplicatum, Cryptocentrum gracillimum, Stellilabium distantiflorum, Notylia latilabia, N. linearis, Brassia parviflora, Oncidium ebrachiatum, O. panduriforme, O. teres, Lockhartia triangulabia, L. variabilis* and *Dichaea verrucosa.*—*J. M. Greenman.*

6705. Beauverd, Gustave. **Notes sur les Taraxacum à ligules enroulées.** [**Notes on Taraxacums with inrolled ligules.**] Vierteljahrsschr. Naturforsch. Ges. Zürich 69 (Beiblatt No. 3): 1-3. 1924.—The author mentions and figures 4 Taraxacums of the Alps with inrolled ligules, namely: *Taraxacum fontanum* Handel-Mazz., *T. cucullatum* Dahlst., *T. stramineum* var. *latissimum* Bvrd., and *T. stramineum* var. *runcinatum* Bvrd.—*John H. Schaffner.*

6706. Benoist, R. **Descriptions d'espèces nouvelles de Phanérogames de l'Amerique tropicale.** [**New phanerogamic species from tropical America.**] Bull. Mus. Hist. Nat. [Paris] 28: 252, 253. 1922.—The author describes as new *Licania longifolia* and *Couepia caryophylloides* from French Guiana, and *Parinarium pajura* from Brazil.—*John M. Fogg, Jr.*

6707. Benoist, R. **Descriptions d'espèces nouvelles du genre Pourouma (Moracées).** [**New species of Pourouma.**] Bull. Mus. Hist. Nat. [Paris] 28: 318–321. 1922.—The author describes as new the following from tropical America: *Pourouma Melinonii, P. maroniensis, P. laevis, P. radula, P. scobina,* and *P. apiculata* Spruce mss.—*John M. Fogg, Jr.*

6708. Benoist, R. **Descriptions d'espèces nouvelles du genre Strobilanthes (Acanthacées).** [**New species of Strobilanthes.**] Bull. Mus. Hist. Nat. [Paris] 28: 94–99. 1922.—This article includes descriptions of the following new species from China: *Strobilanthes longiflorus, S. dryadum, S. myurus, S. leucotrichus, S. Duclouxii, S. rotundifolius, S. nemorosus,* and *S. stolonifer.*—*John M. Fogg, Jr.*

6709. Benoist, R. **Descriptions d'espèces nouvelles du genre Strobilanthes (Acanthacées).** [**New species of Strobilanthes.**] Bull. Mus. Hist. Nat. [Paris] 28: 186–190. 1922.—Seven new species and 2 new varieties are described, all from southeastern Asia: *Strobilanthes flexus; S. pterocladus; S. Fauriei; S. densus; S. torrentium; S. cognatus; S. anisandrus; S. hygrophiloides* Clarke var. *subnudus;* and *S. Dalziellii* W. Smith var. *glaber.*—*John M. Fogg, Jr.*

6710. Berger, Alwin. **Roseocactus, a new genus of Cactaceae.** Jour. Washington [D. C.] Acad. Sci. 15: 43–48. *Fig. 1, 2.* 1925.—From a detailed study of several plants formerly included under *Ariocarpus* Scheidweiler, the author concludes that the only species which can positively be left under that genus is the type species, *A. retusus.* Three other species formerly so included, he places under the new genus, **Roseocactus,** as follows: *R. fissuratus* (*Mammillaria fissurata* Engelm.), *R. Lloydii* (*Ariocarpus Lloydii* Rose), and *R. Kotschoubeyanus* (*Anhalonium Kotschoubeyanum* Lemaire).—*Helen M. Gilkey.*

6711. Blake, S. F. **Five new plants from Venezuela.** Jour. Washington [D. C.] Acad. Sci. 14: 452–456. 1924.—*Draba Bellardii, Aragoa lucidula, Erigeron blepharophyllus, Desmanthodium blepharopodum,* and *Riencourtia Pittieri* are described.—*Helen M. Gilkey.*

6712. Blake, S. F. **New plants from Central and South America.** Jour. Washington [D. C.] Acad. Sci. 14: 284–293. 1924.—The following new species are cited: *Urtica granulosa, Drymaria cognata, D. peninsularis, Bauhinia eucosma, B. obovata, Stylosanthes linearis, Caperonia angusta, Meliosma idiopoda, Vaccinium dasygynum, V. retifolium, Macleania eryphylla, Forsteronia amblybasis, Fischeria boliviana, F. funebris* (*Fischeria Martiana* var. *funebris* Donn. Smith); and *Hypericum galinum* is the new name given to *H. denticulatum* HBK., not Walt.—*Helen M. Gilkey.*

6713. Brown, W. H., and R. Kienholz. **Cycas Chamberlainii, a new species.** Philippine Jour. Sci. 26: 47–51. *Pl. 1–2, fig. 1.* 1925.—A very complete description of this sylvan species is given, based on material from Mount Arayat, Pampanga Province, Luzon, Philippine Islands.—*E. D. Merrill.*

6714. Burkill, I. H. **Orchid notes.** Gard. Bull. Straits Settlements 3: 292–296. *16 fig.* 1924.—*Oberonia fungum-olens* n. sp. is described and figured; a comparison, with figures, between *Coelogyne speciosa* Lindl. and *C. celebica* J. J. Sm. is made; and *Dendrobium albicolor* Ridl. and *D. Haniffii* Ridl. are figured, with notes.—*R. E. Holttum.*

6715. Burkill, I. H. **Two hybrid trees of Hevea brasiliensis × H. confusa.** Gard. Bull. Straits Settlements 3: 257–258. 1924.—The flowers of 2 trees raised from seed of *H. confusa* growing among *H. brasiliensis* are described. The trees differ slightly, but are both hybrids, showing characters of the 2 parents.—*R. E. Holttum.*

6716. Burkill, I. H. **Varieties of Dioscorea pentaphylla in Malaysia.** Gard. Bull. Straits Settlements 3: 258–259. *1 pl.* 1924.—Five varieties of *Dioscoria pentaphylla* are

described: *malaica, papuana, javanica, plamata,* and *sacerdotalis.* Illustrations of tubers of the last 3 are given.—*R. E. Holttum.*

6717. Camus, A. **Graminées nouvelles de Madagascar.** [New Gramineae from Madagascar.] Bull. Mus. Hist. Nat. [Paris] 28: 440–443. 1922.—The author describes 6 new species, as follows: *Poa ankaratrensis* Camus & Perrier, *P. Perrieri, P. madagascariensis, Festuca Perrieri, Brachypodium Perrieri,* and *B. madagascariense* Camus & Perrier.—*John M. Fogg, Jr.*

6718. Camus, A. **Note complémentaire sur une Graminée, le Gigantochloa cochinchinensis A. Camus.** [Supplementary note on Gigantochloa cochinchinensis.] Bull. Mus. Hist. Nat. [Paris] 28: 381. 1922.—Further notes are recorded concerning this grass described originally in the Bull. Mus. Hist. Nat. [Paris] 26: 567. 1920.—*John M. Fogg, Jr.*

6719. Camus, A. **Un Bambou nouveau d'Annam.** [A new bamboo from Anam.] Bull. Mus. Hist. Nat. [Paris] 28: 444, 445. 1922.—*Oxytenanthera Hayatae* is described as a new species from southeastern Asia.—*John M. Fogg, Jr.*

6720. Camus, A. **Un genre nouveau de Bambusées.** [A new genus of Bambuseae.] Bull. Mus. Hist. Nat. [Paris] 28: 100–102. *Fig. 1–15.* 1922.—The author describes **Neohouzeaua** n. gen. of the Gramineae, tribe Bambuseae, and *N. mekongensis* from Indo-China. *N. Dullooa* (*Teinostachyum Dullooa* Gamble) is included in the genus as a new combination.—*John M. Fogg, Jr.*

6721. Camus, Aimée. **Genres nouveaux de Bambusées malgaches.** [New genera of Malgachian bamboos.] Compt. Rend. Acad. Sci. Paris 179: 478–480. 1924.—Four genera were formerly known for Madagascar. Perrier and Bathie added 4 more, 3 of them new genera to the island, and all of their species endemic. A new genus, **Pseudocoix** is described, with a new species, *P. Perrieri.* The genus **Hickelia** with a new species, *H. madagascariensis,* are also described.—*C. H. Farr.*

6722. Cardot, J. **Notes sur des espèces asiatiques des genres Stranvaesia, Raphiolepis, Amelanchier, Osteomeles et Parinarium.** [Notes on the Asiatic species of . . . .] Bull. Mus. Hist. Nat. [Paris] 28: 191–193. 1922.—The author discusses briefly the distribution and some of the critical characters of the following forms: *Stranvaesia nussia* Dcne. (*S. glaucescens* Lindl.); *Raphiolepis indica* Lindl. and its vars. *latifolia, angustifolia,* and *mekongensis; R. japonica* Sieb. & Zucc. (*R. ovata* Briot); *Amelanchier asiatica* Endl. and its var. *sinica* Schneid.; *Osteomeles anthyllidifolia* Lindl.; and *Parinarium anamense* Hce.—*John M. Fogg, Jr.*

6723. Chase, Agnes. **A new species of Panicum found in alfalfa seed.** Jour. Washington [D. C.] Acad. Sci. 14: 343–345. *Fig. 1.* 1924.—*Panicum Hillmani* is described. It occurs on prairies and plains, Kansas to Texas.—*Helen M. Gilkey.*

6724. Chase, Agnes. **Aciachne, a cleistogamous grass of the high Andes.** Jour. Washington [D. C.] Acad. Sci. 14: 364–366. *Fig. 1.* 1924.—Though *Aciachne* is commonly described as having the staminate stage unknown, the fact that the plant fruits abundantly suggested cleistogamy as an explanation. From an abundance of material collected by A. S. Hitchcock in Peru, the author found in every floret, minute anthers which, howeaer were larger than those found in some cleistogenes. *Helen M. Gilkey.*

6725. Cheel, E., and C. T. White. **On a new species ofMelaleuca (family Myrtaceae) from Southern Queensland.** Proc. Roy. Soc. Queensland 36: 41–43. *1 fig.* 1924. —*Melaleuca Groveana* is described and herbarium specimens ofit illustrated.—*W. D. Francis.*

6726. Chen, Ming Shu. [An essay on the botanical name for the Chinese paper mulberry.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 9: 78–86. 1924.—Discussion is given of the botanical name for the Chinese paper mulberry *Broussonetia papyrifera* Vent. Its confusion with the Japanese species, *Broussonetia Kazinoki* Sieb. is also fully pointed out.—*Chunjen C. Chen.*

6727. Chevalier, A., et A. Camus. **Un Bambou nouveau de Cochinchine.** [A new bamboo from Cochin-China.] Bull. Mus. Hist. Nat. [Paris] 28: 379–380. 1922.—*Bambusa procera* is described as new, and its systematic position and habitat are discussed.—*John M. Fogg, Jr.*

6728. Clute, Willard N. **Elementary species of Rudbeckia.** Amer. Bot. 30: 158–159. 1924.—A brief description of 5 flower forms of *Rudbeckia hirta.* A new flower form is described for which the name *Rudbeckia hirta dichrona* is proposed and a new vegetative form for which the name *Rudbeckia hirta gigantea* is given.—*Susan P. Nichols.*

6729. Danguy, Paul. **Contribution à l'étude des espèces arborescentes de Madagascar.** [Arboreal species from Madagascar.] Bull. Mus. Hist. Nat. [Paris] 28: 247–251. 1922.—One new genus and 6 new species are described, as follows: *Artabotrys oligospermus; Olax glabriflora; Apodytes Thouvenotii, A. Hazomaitso;* **Schrameckia** n. gen. of the Monimiaceae, *S. madagascariensis;* and *Tambourissa Thouvenotii.—John M. Fogg, Jr.*

6730. Danguy, P. **Stylidiacées.** [Stylidiaceae.] In: Lecomte, H. Fl. Gén. Indo-Chine 3: 664. 1924.—This family is represented in Indo-China by 3 species of *Stylidium*, no new forms being described.—*E. D. Merrill.*

6731. Danguy, P. **Une Caprifoliacée nouvelle d'Indo-Chine.** [A new Caprifoliaceous plant from Indo China.] Bull. Mus. Hist. Nat. [Paris] 28: 378. 1922.—The author describes, as new, *Sambucus Eberhardtii.—John M. Fogg, Jr.*

6732. Danguy, Paul. **Une Combrétacée nouvelle de Madagascar.** [A new Combretaceae from Madagascar.] Bull. Mus. Hist. Nat. [Paris] 29: 108. 1923.—*Terminaliopsis tetrandus* n. sp. is described.—*John M. Fogg, Jr.*

6733. Danguy, P., et H. Chermezon. **Sur quelques espèces et variétés nouvelles de la République de l'Équateur.** [New species and varieties from Ecuador.] Bull. Mus. Hist. Nat. [Paris] 28: 432–439. 1922.—The following new species and varieties, based upon collections by Rivet in the Andes of Ecuador, are described. *Berberis pichinchensis* Turcz. var. *Riveti; Cerastium Trianae; Brachyotum Riveti; Miconia Riveti; Arcythophyllum Riveti; Macleania punctata* Hook. var. *puberula; Ceratostema chillacochense; Gaultheria serrulata; Bejaria aestuans* Mutis var. *macrantha; Columellia lucida; Bartsia laxissima; Gardoquia taxifolia* HBK. var. *loxensis; Telanthera aristata; T. Riveti; Euphorbia Preslii* Guss. var. *andicola; Croton menthodorus* Benth. var. *Riveti; Bomarea glaucescens* Baker var. *grandiflora;* and *B. subarcuata.—John M. Fogg, Jr.*

6734. Denis, M. **Euphorbiacées malgaches.** [Malagasy Euphorbiaceae.] Bull. Mus. Hist. Nat. [Paris] 28: 254, 256. 1922.—The author discusses the critical characters of *Macaranga alnifolia* Baker and *M. ferruginea* Baker, and describes as new *Dalechampia Perrieri* and *D. chlorocephala* from Madagascar.—*John M. Fogg, Jr.*

6735. Denis, M. **Une nouvelle Euphorbiée africaine: Monadenium LeTestuanum nov. sp.** [A new African Euphorbia.] Bull. Mus. Hist. Nat. [Paris] 28: 194–195. 1922.—*Monadenium LeTestuanum* from Ubangi is described as new.—*John M. Fogg, Jr.*

6736. Duthie, A. V. **The Eriospermums of the Stellenbosch Flats.** Ann. Univ. Stellenbosch [Cape Town] 2: 1–22. *Pl. 1–6.* 1924.—A statement concerning the general characteristics of the genus and a key to the species precede the descriptions of the 10 species and varieties recognized. English descriptions are given of the following new species: *Eriospermum graminifolium, E. confertum* Baker var. *aureum,* and *E. fasciculatum.* (For Latin descriptions see Ann. Bolus Herb. 4: 29–30. 1925.)—*J. M. Greenman.*

6737. Gagnepain, F. **Composées.** [Compositae.] In: Lecomte, H. Fl. Gén. Indo-Chine 3: 577–663. *Fig. 63–72.* 1924.—The author presents a continuation and conclusion of the treatment of this family, considering the genera *Cotula* to *Ainsliaea* (Nos. 34 to 78). About 25 of the genera are represented by single species, the 2 largest being *Senecio* and *Lactuca,* with 9 species each. The only new species described is *Senecio salucnensis* Diels, the other new forms having been described by the author in previous papers.—*E. D. Merrill.*

6738. Guillaumin, A. **Contribution à la flore de la Nouvelle-Calédonie. XXXVII. Plantes recueillies par M. Franc (Suite).** [Contribution to the flora of New Caledonia.] Bull. Mus. Hist. Nat. [Paris] 28: 103–108. 1922.—A list is given of 99 species, chiefly of the families Euphorbiaceae, Proteaceae, Cyperaceae, and Gramineae. Two new species are described, namely: *Grevillea pronyensis* and *Baloghia anisomera.—John M. Fogg, Jr.*

6739. Guillaumin, A. **Contribution à la flora de la Nouvelle-Calédonie. XXXVIII. Plantes recueillies par M. Franc (Suite) (Supplément.)** [Contribution to the flora of New Caledonia.] Bull. Mus. Hist. Nat. [Paris] 28: 196–199. 1922.—The following new species are described: *Boronia pronyensis;* **Franciella** n. gen. of the Rubiaceae, *F. pterocarpon;* and *Notelaea Francii.—John M. Fogg, Jr.*

6740. Guillaumin, A. **Contribution à la flore de la Nouvelle-Calédonie. XXXIX. Plantes recueillies par M. Franc (2e Supplément).** [Contribution to the flora of New

Caledonia.] Bull. Mus. Hist. Nat. [Paris] 28: 545–546. 1922.—The author describes *Eugenia pronyensis*, n. sp., and lists 24 Orchidaceae collected by M. Franc from this region.—*John M. Fogg, Jr.*

6741. Guillaumin, A. **Contribution à la flore de la Nouvelle-Calédonie. XL. Plantes recueillies par M. et Mme. Le Rat de 1900 à 1910.** (4e Supplément.) **XLI. Plantes de collecteurs divers (Suite).** [Contribution to the flora of New Caledonia.] Bull. Mus. Hist. Nat. [Paris] 29: 112–118. 1923.—The author lists 18 miscellaneous species and 30 Orchidaceae from the LeRat collections, and 63 species, chiefly Orchidaceae and Leguminosae, from different collectors.—*John M. Fogg, Jr.*

6742. Guillaumin, A. **Palmiers nouveaux des serres du Muséum.** [New palms from the Museum greenhouses.] Bull. Mus. Hist. Nat. [Paris] 28: 542–544. 1922.—The author describes as new *Chamaedorea exorrhiza* Wendland mss., and *C. Biolleyi* from Costa Rica, both grown from seed in the Museum hothouse.—*John M. Fogg, Jr.*

6743. Gustafsson, C. E. **Några ord om Rubusformernas systematik.** [A few words concerning the systematics of the Rubus forms.] Bot. Notiser 1922: 190–196. 1922.—The author points out difficulties in classifying species of blackberries and points out how many confusions may be avoided. The difficulties arise from the facts that most of the species are unstable and parallel developments are found in species not closely related, that many authors have drawn the description of collective species so as to cover all the subspecies they comprise, and afterwards distinguish the individual subspecies. The description of the collective species naturally is drawn very broad, so broad that none of the components exactly fit the description. Besides, the species often hybridize and sometimes the hybrids take upon themselves characters which are not found in either parent. In deciding on the relationship of a certain species one can not use merely 1 or 2 characters but must consider the general average of characters, etc.—*P. A. Rydberg.*

6744. Gustafsson, C. E. **Rubus Scheutzii Lindeb. och Rubus thyrsanthus F.** [Rubus Scheutzii Lindeb. and Rubus thyrsanthus F.] Bot. Notiser 1922: 155–158. 1922.—*Rubus Scheutzii* has been known as *R. thyrsoideus* var. *virescens* Scheutz, and *R. Lindebergii* var. *viridis* F. Aresch. Areschoug also has regarded it as *R. cordifolius* Weihe and *R. Muenteri* Marss. In Germany the name *R. Scheutzii* has generally been adopted. Regarding *R. thyrsanthus*, the author regards it as distinct from *R. arduennensis* Lib. of which it has been regarded both as a subspecies and as a synonym.—*P. A. Rydberg.*

6745. Harper, Roland M. **A new heart-leaf and other interesting plants from Autauga County, Alabama.** Torreya 24: 77–83. *1 fig.* 1924.—The author describes a trip to the region near Booth, Autauga County, Alabama, in May, 1924. One new species, *Hexastylis speciosa*, is described. Notes on 13 other noteworthy species are added.—*J. C. Nelson.*

6746. Heil, Hans. **Chamaegigas intrepidus Dtr., eine neue Auferstehungs pflanze.** [C. intrepidus Dtr., a new resurrection plant.] Beih. Bot. Centralbl. Abt. I. 41: 41–50. *Pl. 1–4.* 1924.—Dinter discovered this plant in southwest Africa in 1906. Not only the stems but also the leaves remain alive during months of drought. There are 2 kinds of leaves, floating and submerged. The plants dry up with the leaves contracted and brown. Placed in water at 40°C., the leaves doubled their length in 15 minutes and in a few hours were full length and green. The outer leaves were dead. The change in the leaf is brought about by tracheids in the bundle, called contraction xylem. From the structure of the flower it is placed in the Scrophulariaceae near the genus *Lindernia*.—*L. Pace.*

6747. Henderson, M. R. **A note on Semecarpus Curtisii King.** Gard. Bull. Straits Settlements 3: 290–291. 1924.—In the south of the Malay Peninsula there is a form of *Semecarpus Curtisii* differing from that found in the north; it is described as var. *brevipetiolata*.—*R. E. Holttum.*

6748. Henderson, M. R. **Two genera of plants, new to the Malay Peninsula.** Jour. Federated Malay States Mus. 11: 187–188. 1924.—The genera *Anemone* and *Lonicera* are here recorded from the Malay Peninsula for the 1st time. The species are *A. sumatrana* de Vries and *L. malayana* n. sp.—*R. E. Holttum.*

6749. Henriksson, J. **Anémoné némorosa L. v. marginata n. var.** Bot. Notiser 1922: 103–104. 1922.—A short diagnosis is given in Latin, description and discussion in Swedish. The type locality is Karlslund, Gunnarsnäs Parish, Dal, Sweden.—*P. A. Rydberg.*

6750. Jávorka, S. **Uj adatok Albânia flórájához.** (**Novitates florae Albanicae.**) [**Novelties of the flora of Albania.**] Bot. Közlemények **19**: 17–29. 1921.—This article consists of critical notes on several previously published species of Albanian plants and descriptions of the following new species, subspecies and forms of which Jávorka is the author unless otherwise indicated: *Polygonum albanicum, Cerastium hekuravense, Aconitum Pantocsekianum* Deg. & Bald. f. *koprivnikense* Andras. & Jáv., *Ranunculus Degeni* Kümm. & Jáv., *R. sardous* Cr. subsp. *balcanicus* Kümm. & Jáv., *Erysimum korabense* Kümm. & Jáv., *E. Kümmerlei, Draba korabensis* Kümm & Deg., *Potentilla apennina* Ten. f. *škelsensis, Sanguisorba albanica* Andras & Jáv., *Oxytropis sericea* (Lam.) Simk. subsp. *korabensis* Kümm. & Jáv., *Ligusticum albanicum, Peucedanum serpentini* Andras. & Jáv., *Onosma stellulatum W.* & K. f. *serpentini, Veronica Andrasovszkyi, Betonica Jacquini* Gren. & Godr. subsp. *albanica* Kümm. & Jáv., *B. officinalis* L. subsp. *škipetarum, Calamintha alpina* (L.) Benth f. *albanica* Kümm. & Jáv., *Gentiana anisodonta* Borb. subsp. *albanica, G. Nopcsae, Edrajanthus graminifolius* (L.) DC. subsp. *albanicus* Deg. & Kümm., *Achillea Fraasi* F. Schltz. f. *korabensis* Kümm. & Jáv., *Senecio doronicum* L. f. *albanicus* Kümm. & Jáv., *Cineraria* sive *Senecio korabensis* Kümm. & Jáv., and *Willemetia stipitata* (Jacq.) Cass. f. *albanica* Kümm. & Jáv.—*Gy. de Istvanffi.*

6751. Johansson, K. **Ulmus-studier på Öland.** [**A study of the elms of Oland.**] Bot. Notiser **1922**: 197–202. *Fig. 1.* 1922.—The author discusses *Ulmus glabra* Huds. (*U. scabra* Mill., *U. montana* With.) with its variety *grandidentata* Moss.; *U. foliacea* Gilib. (*U. glabra* Mill.) with its var. *xanthochondra* Beck and var. **pilosula** n. var.; and *U. laevis* Pall. (*U. effusa* Willd.).—*P. A. Rydberg.*

6752. Jumelle, Henri. **Les Neodypsis, Palmiers de Madagascar.** [**Neodypsis, palms of Madagascar.**] Compt. Rend. Acad. Sci. Paris **179**: 448–450. 1924.—The history of the study is reviewed and descriptions of several species are given. It is stated that the terminal buds of many species are edible; those of 1 are nauseating; and 2 are poisonous.—*C. H. Farr.*

6753. Jumelle, Henri. **Neodypsis et Chrysalidocarpus, Palmiers de Madagascar.** [**Neodypsis and Chrysalidocarpus, palms of Madagascar.**] Compt. Rend. Acad. Sci. Paris **179**: 249–251. 1924.—The distinction between these 2 genera is not readily made, but it is most clearly expressed in the seed. Particular attention in this paper is given to the support of the contention that *Chrysalidocarpus Baronii* of Beccari should become *Neodypsis Baronii.* —*C. H. Farr.*

6754. Keller, Robert. **Neue Varietäten und Formen der europäischen Rosenflora, unter besonderer Berücksichtigung der schweizerischen Wildrosen.** [**New varieties and forms of the European rose flora with special reference to the wild roses of Switzerland.**] Vierteljahrsschr. Naturforsch. Ges. Zürich **69** (Beiblatt No. 4): 1–52. 1924.—The following varieties and forms are described: *Rosa sempervirens* L. var. *levipes*, var. *prostrata* Desv. f. *conica; Rosa arvensis* Huds. var. *complicata* f. *scaphusiensis; Rosa gallica* L. var. *haplodonta* Borb. f. *pilifolia*, var. *subinermis* Chab. f. *subcrenata*, var. *trichophylla*, var. *trichophylla* f. *acuta*, var. *subglandulosa* Borb. f. *latisepala*, var. *baldensis* f. *adenophora*, and *R. gallica* L. f. *micropetala; Rosa Jundzillii* Besser. var. *banatica*, var. *pseudohybrida;* Rosa pomifera Herrm. var. *proxima* (Cott.) Christ f. *dalensis* and f. *setulifera; Rosa tomentosa* Sm. var. *rupigena*, var. *pseudo-farinosa*, var. *Portmannii*, var. *foetida* (Bast.) Seringe f. *chautagniensis* and f. *reflexicalyx*, var. *cuspidata* Godet f. *pseudomissa; Rosa sicula* Tratt. var. *setigera*, var. *pilosa; Rosa glutinosa* Sib. & Sm. var. *leioclada* Christ f. *elongatipes* and f. *Heldreichii; Rosa elliptica* Tausch. vars. *graeca* and *palantina; Rosa micrantha* Sm. var. *typica* Christ f. *rhomboidea*, var. *Chenivierei*, var. *grossiserrata* f. *pauciglandulosa*, var. *subcuneata* f. *cuneifoliolata*, var. *lepida*, var. *eriostyla; Rosa agrestis* Savi, var. *minuscula*, var. *columbiensis* and var. *lasiopoda; Rosa stylosa* Desv. var. *palantina; Rosa obtusifolia* Desv. var. *obtusifolioides* f. *Calegarii* R. Kell. & P. Rosi. f. *alsgoviensis*, var. *esinensis* f. *rectispina*, var. *sclerophylla* Chr. f. *pseudo-agrestis*, var. *macrostyla*, var. *Petri Rossi*, var. *hispidior* f. *rhenana*, var. *virensis*, var. *anacantha*, var. *Borreri* Baker f. *pinacholensis*, var. *bipinnata*, var. *capucinensis* f. *hispidula*, var. *fallens; Rosa abietina* Gren. var. *Bernoullii*, var. *Brüggeri; Rosa canina* L. var. *andegavensis* Bast. f. *pseudo-mutabilis*, f. *psilophylla*, var. *lanigera* Schwertschl. f. *fontana*, var. *transitoria* f. *pradensis* and f. *subpubens*, var. *dumalis* Baker f. *bicolor*, var. *adenocalyx* f. *glaucina*, var. *verticillacantha* Baker f. *comatistyla*, f. *macrostyla*, var. *Déséglisei* Christ f. *Rossii*. var. *Thuilleri* Chr. f. *sturensis*, f. *sublongistyla*,

var. *subcaesia*, var. *hemitricha* (Rip.) f. *Coazii*, var. *Coquozii*, var. *sabaudica; Rosa Afzeliana* Fr. var. *typica* Chr. f. *sub-Seringei*, var. *haberiana* (Puget) Chr. f. *inermis*, var. *diversiglandulosa*, var. *umbellata*, var. *diodus* f. *adenocalyx*, var. *oligotricha*, var. *microphylla* f. *glaucescens*, var. *Kummeri*, var. *intromissa* f. *inermis*, var. *adenophylla* var. *praesangensis*, var. *subhispida*, var. *pastoralis* f. *Christianseni*, var. *inaequiserrata*, var. *znaimensis*, and var. *Gelmii*.—*John H. Schaffner.*

6755. Killip, Ellsworth P. **Notes on Peruvian Urticaceae of the Marshall Field exploration.** Jour. Washington [D. C.] Acad. Sci. **15**: 48–56. 1925.—The following new species are described: *Urtica Macbridei*, *Pilea cordifolia*, *P. delicatula*, *P. tarmensis*, *P. Macbridei*, *P. verrucosa*, *P. orbiculata*, and *Myriocarpa laevigata*. The distribution of the following previously known species is cited: *Urtica magellanica* Poir., *U. ballotaefolia* Wedd., *Urera laciniata* Wedd., *U. baccifera* (L.) Gaud., *Pilea microphylla* (L.) Liebm., *P. thymifolia* (HBK.) Blume, *P. diversifolia* Wedd., *P. minutiflora* Krause, *P. dauciodora* Wedd., *P. marginata* Wedd., *P. lamioides* Wedd., *P. pulegifolia* (Poir.) Wedd., *Boehmeria aspera* Wedd., *B. Pavonii* Wedd., *B. Weddelliana* Killip (n. nom.), *Pouzolzia aspera* Wedd., *Myriocarpa densiflora* Benth., *Phenax hirtus minor* Wedd., *P. laevigatus* Wedd., *P. laxiflorus* Wedd., and *Parietaria debilis* Forst.—*Helen M. Gilkey.*

6756. Larbaud, Marguerite. **Anomalies dans les fleurs d'Armeria alpina Willd.** [**Anomalies in the flowers of Armeria alpina.**] Bull. Mus. Hist. Nat. [Paris] **28**: 446, 447. 1922.—Specimens of *A. alpina* from Pic du Midi, France, show scarious flowers, poorly developed corolla, reduced stamens, and very short styles.—*John M. Fogg, Jr.*

6757. Lecomte, H. **Au sujet du Faguetia, Anacardiacée de Madagascar.** [**Faguetia from Madagascar.**] Bull. Mus. Hist. Nat. [Paris] **28**: 182–183. 1922.—The genus *Faguetia* was erected by Marchand to include a single species, *F. falcata*, from Madagascar. As a result of more recent collecting and study additional information concerning this plant is recorded. —*John M. Fogg, Jr.*

6758. Lecomte, H. **Deux Sapotacées nouvelles de Madagascar.** [**Two new Sapotaceous plants from Madagascar.**] Bull. Mus. Hist. Nat. [Paris] **28**: 87, 88. 1922.—The author describes as new species: *Sideroxylon tampinense* and *Mimusops silvestris*.—*John M. Fogg, Jr.*

6759. Lecomte, Henri. **Existence en Indochine d'un genre américain de la famille des Sapotacées.** [**An American genus of the Sapotaceae in Indo-China.**] Bull. Mus. Hist. Nat. [Paris] **29**: 179, 180. 1923.—*Bumelia Harmandii* n. sp. is described, and a key is given to the genera of Sapotaceae known from this region.—*John M. Fogg, Jr.*

6760. Lecomte, H. **Sur une Rubiacée arborescente de Madagascar.** [**An arborescent Rubiaceous plant.**] Bull. Mus. Hist. Nat. [Paris] **28**: 376–377. 1922.—The author describes *Pyrostria madagascariensis* n. sp. The wood of this plant is put to many uses.—*John M. Fogg, Jr.*

6761. Lecomte, H. **Une Sapotacée de Madagascar en voie de disparition.** [**A Sapotaceous plant from Madagascar in danger of extinction.**] Bull. Mus. Hist. Nat. [Paris] **28**: 184, 185. 1922.—Recent study of good fruiting material of a plant placed by Hooker f. in the proposed genus *Cryptogyne*, confirms the author's belief that it should be called *Sideroxylon Gerardianum* (Hook. f.) H. Lec. According to M. Perrier de la Bathie, this plant, formerly abundant in Madagascar, is now nearly extinct.—*John M. Fogg, Jr.*

6762. Leonard, E. C. **New plants from the Dominican Republic.** Jour. Washington [D. C.] Acad. Sci. **14**: 413–417. 1924.—From nearly 3000 plants collected in 1922 by W. L. Abbott for the National Herbarium, many have proved new to science. From these, the following new species are described: *Sophora albo-petiolulata*, *Zanthoxylum bifoliolatum*, *Z. venosum*, *Maba Urbaniana*, *Solanum Abbottii*, *Tabebuia rugosa*, *T. rubriflora*, *T. paniculata*, *Justicia alsinoides*, and *Siphocampylos linearifolius*.—*Helen M. Gilkey.*

6763. Mandl, Karoly, es Arpad Kiss. **Uj keletszibériai növények.** [**New plants from eastern Siberia.**] Bot. Közlemények **19**: 89–94. 1921.—The following new plants are described: *Alnus Alisoviana* Mandl, *Paeonia vernalis* Mandl, *Corydalis repens* Mandl & Mühldorf, *C. repens* vars. *pectinata* and *immaculata* Mandl, *Euphorbia Savaryi* Kiss, *Viola Mühldorfi* Kiss, *V. Alisoviana* and f. *albiflora* Kiss.—*Gy. de Istvanffi.*

6764. Notø, Andr. **Nye planteformer fra Salten.** [**New plant forms from Salten.**] Nyt

Mag. Naturvidensk. [Kristiania] 61: 223-283. 1924.—The following new plants from the Salten district in northern Norway are described: *Carex æqualis* which stands very near to *C.Oederi* and should perhaps be regarded as a subspecies of that plant, *Saxifraga cotyledon* L. subsp. *pertrita, Hieracium petiolatum* Ehfstr. var. *brevipoda, H. ofotense, H. nigristylum, H. Carlsonii, H. curvaticranum, H. subochroglossum, H. vicosum, H. adipatum, H. orthopoides, H. brevicollum, H. cumulatum, H. limatum, H. serenum, H. stibergense, H. stictocentrum, H. microceps, H. ariphilum, H. dasychætoides, H. moënse, H. phalarograpticeps H. ariglaucoides, H. aridum, H. subargenteum, H. fauskense, H. exterium, H. poliocranum, H. dimorphophyllum, H. austericeps, H. subaustericeps, H. submoybdinum, H. psepharomorphoides, H. capnothrichum* Dalst., *H. capnothrichoides* Dahlst., *H. subcapnothrichoides, H. liguatellum, H. copholepium* and var. *subintegrum, H. submundulum* Dahlst., *H. parvellum, H. subopeatodontum, H. pseudometaliceps, H. solutum, H. varianellum, H. atrocranum, H. arduum, H. subgemellum, H. subspiculatiforme, H. tumidum* Dahlst., and *H. gyndelense.—K. Münster Strøm.*

6765. Paczoski, Józef. **Cytisus Skrobiszewskii n. sp.** Acta. Soc. Bot. Poloniae 2: 64-65. 1923.

6766. Pau, C. **El herbario de Planellas.** [Planellas's herbarium.] Brotéria. Sér. Bot. 21: 49-82. *Pl. 1.* 1924.—The present article continues without new heading from the previous issue of the journal, and brings to a conclusion the account of Planellas's herbarium that has run through several issues. (See Bot. Absts. 13, Entry 7421; 12, 3583; 11, 1599; 10, 2006.) The present installment extends from the Compositae, genus *Hedypnois,* to the end of the Gramineae. Besides minor notes there are more extended notices on *Leontodon hastile* Plan., *Scorsonera hispanica* Plan., *Primula Perreiniana* Flug., *Anchusa officinalis* L., *Linaria delphinoides* Gay, *Gratiola officinalis* Plan., *Odontites tenuifolia* G. Don, *Orobanche coerulea* Willk., *Euphorbia platyphyllos* Plan., *Setaria ambigua* Guss., *Lolium glumosum* Plan., *L. perenne* L., and *L. rigidum* Gaud. These notes frequently list synonyms and give distributional data. There are apparently no new combinations. The plate is a photographic reproduction, natural size, of the plant of *Dianthus caespitosifolius* Plan., preserved in Planellas's herbarium. —*E. B. Chamberlain.*

6767. Pellegrin, F. **Plantae Letestuanae nouvae ou Plantes nouvelles récoltées par M. Le Testu de 1907 à 1919 dans le Mayombe congolais. IV.** [New plants collected by Le Testu in Mayomba.] Bull. Mus. Hist. Nat. [Paris] 28: 89-93. 1922.—The following species are described as new: *Dichapetalum LeTestui, D. nyangense, D. malembense, Tapura LeTestui; Rhaptopetalum sindarense;* and *Salacia LeTestui.—John M. Fogg, Jr.*

6768. Pellegrin, F. **Plantae Letestuanae novae ou Plantes nouvelles récoltées par M. Le Testu de 1907 à 1919 dans le Mayombe congolais. V.** [New plants collected by Le Testu in Mayomba.] Bull. Mus. Hist. Nat. [Paris] 28: 312-317. 1922.—The author describes 6 new species of flowering plants, as follows: *Salacia Letestuana; Pancovia floribunda; Sorindeia LeTestui, S. tchibangensis; Trichoscypha parvifloroides,* and *T. nyangensis.—John M. Fogg, Jr.*

6769. Pellegrin, François. **Plantae Letestuanae novae ou Plantes nouvelles récoltées par M. Le Testu de 1907 à 1919 dans le Mayombe congolais. VI.** [New plants collected by Le Testu in Mayomba.] Bull. Mus. Hist. Nat. [Paris] 29: 109-111. 1923.—Three new species are described, as follows: *Cnestis leucanthoides, Milletia LeTestui,* and *Baphia LeTestui.—John M. Fogg, Jr.*

6770. Pellegrin, François. **Plantae Letestuanae novae ou Plantes nouvelles récoltées par M. Le Testu de 1907 à 1919 dans le Mayombe congolais. VII.** [New plants collected by Le Testu in Mayomba.] Bull. Mus. Hist. Nat. [Paris] 29: 266-269. 1923.—Four new species are described, as follows: *Detarium LeTestui; Parinarium ingangense; Combretum itsoghense;* and *Syzygium marounzense.—John M. Fogg, Jr.*

6771. Petch, T. **Campbellia aurantiaca, Wight, and Christisonia albida, Thwaites.** Ann. Bot. 38: 679-697. *20 fig.* 1924.—Owing to confusion in the original descriptions much difference of opinion has existed in regard to the classification of these Ceylonese parasites on *Strobilanthes.* They are here described in full. *Campbellia* should be included in the Scrophulariaceae and *C. aurantiaca* is distinct from *C. cytinoides.* Thwaites' specimens of *Christisonia albida* are in part *Christisonia bicolor* var. *spectabilis* which should be considered a distinct species, and in part *Campbellia aurantiaca.—W. P. Thompson.*

6772. Petrie, D. **Descriptions of new native flowering plants.** Trans. and Proc. New Zealand Inst. **55**: 95–98. 1924.—Described as new are: *Pittosporum Turnerii* near *P. patulum* Hk. f., *Senecio remotifolius* [see following Entry], *Veronica Carsei* near *V. laevis* Benth., *V. Dartoni*, and *Euphrasia Wilsoni*.—*Wm. Randolph Taylor.*

6773. Petrie, D. **Descriptions of new native flowering plants.** Trans. and Proc. New Zealand Inst. **55**: 434–437. 1924.—New plants described are: *Senecı Spedeni*, *S. Matthewsii*, *S. remotifolius* near *S. elaeagnifolius* Hk. f. [see preceding Entry], *Dracophyllum Adamsii*, *Veronica Dartoni*, and *V. trifida*.—*Wm. Randolph Taylor.*

6774. Piper, Charles V. **A new genus of Leguminosae.** Jour. Washington [D. C.] Acad. Sci. **14**: 363–364. 1924.—A Costa Rican climbing shrub collected 25 years ago by Tonduz is described from this material in the U. S. National Herbarium, under the name **Leycephyllum n. gen.**, with one species, *L. micranthum*. It is apparently closely related to *Calopogonium*.—*Helen M. Gilkey.*

6775. Pittier, H. **New or little known Melastomataceae from Venezuela and Panama. II.** Jour. Washington [D. C.] Acad. Sci. **14**: 447–451. 1924.—The following new species are described: *Miconia gatunensis*, *M. septuplinervis*, *M. caudiculata*, *M. cuspidatissima*, *M. Jahnii*, *Conostegia excelsa*, and *Topobea micrantha*.—*Helen M. Gilkey.*

6776. Рожевиц, Р. Ю. [Rozhevits, R. U.] **О забытом виде Trisetum sibiricum Rupr. [Trisetum sibiricum Rupr., a forgotten species.]** (French résumé.) Известия главного ботанического сада Р. С. Ф С. Р. [Bull. Princip. Jard. Bot. Republique Russe] **21**: 88–91. *1 map.* 1922.—The author demonstrates that under the name, *Trisetum flavescens* (L.) P.B., 2 species have hitherto been confounded—the true *T. flavescens* (L.) P.B. and *T. sibericum* Rupr. The 1st occurs solely in eastern and southern Europe, the Caucasus Region, northwestern Persia and northern Africa; the 2nd occurs throughout European Russia, and in Siberia, Turkestan, northern China, Korea, Japan, North America and the northern part of the West Indies. *T. sibericum* is a very constant species, having only a few geographic forms, such as the subspecies, *litoralis* Rupr., *papillosa* (Hack.) Roshev., and *aenea* (Hook.) Roshev. The distribution of these species and subspecies is shown on the map.—*Frederick V. Rand.*

6777. Samuelsson, Gunnar. **Archieracier från Åsele Lappmark. [Species of Hieracium from Asele, Lappland.]** Bot. Notiser 1922: 159–172. 1922.—The article contains the distribution and localities of the species of *Hieracium* of the region, together with the descriptions of the following new species: *H. pravidens* Joh. & Sam., *H. alipes* Joh. & Sam., *H. caloxanthum* Joh. & Sam., *H. dasycranum* Joh. & Sam., *H. leurolonchum* Joh. & Sam., *H. nepheloides* Joh. & Sam., *H. obellipticum* Joh. & Sam., *H. oligozum* Joh. & Sam., *H. valgescens* Joh. & Sam., *H. Guilielmi* Joh. & Sam., and *H. glaucopallidulum* Joh. & Sam.—*P. A. Rydberg.*

6778. Small, John K. **A new bog-asphodel from the mountains.** Torreya **24**: 86–87. 1924.—*Abama montana* Small n. sp., collected by F. M. Crayton in July 1919 in a swamp near Flat Rock, North Carolina, is described.—*J. C. Nelson.*

6779. Smith, Harry. **Plantae Sinensis. [Plants of China.]** Acta Hort. Gothoburg. Medd. Göteborgs Bot. Trädg. **1**: 1–187. *Pl. 1–20, 10 fig.* 1924.—This article includes the plants collected by Harry Smith on his journeys in China during the years 1921–1922. Certain groups have been referred to specialists. *Saxifraga* is elaborated by H. Smith and the following new species and varieties are described: *Saxifraga flagrans*, *S. flagrans* var. *platyphylla*, *S. heleonastes*, *S. montana*, *S. montana* var. *splendens*, *S. Diapensia*, *S. pseudohirculus* Engler var. *tenuiflora*, *S. cacuminum*, *S. glacialis*, *S. pumila*, *S. angustata*, *S. propagulifera*, *S. sibirica* L. var. *bulbillifera*, *S. saxatilis* and *S. octandra*.—H. Fröderström, to whom the Crassulaceae were referred, describes the following new species, varieties, and combinations: *Sedum Kirilowii* Reg. var. *altum*, *S. eurycarpum*, *S. Telephium* L. f. *verticillatum* (L.), *S. fimbriatum* Franch. var. *genuinum*, *S. fimbriatum* Franch. var. *ramosissimum* (Max.), *S. japonicum* Sieb. f. *rugosum*, and *S. anthoxanthum*.—Carl Christensen, who identified the Pteridophyta designated the following species, varieties, and combinations as new: *Woodsia gracillima; Dryopteris stegnogramme* (Bl.) C. Chr. var. *cyrtomioides*, *D. cochleata* (Don.) Moore var. *squamosa*, *D. heterolaena; Davallia Clarkei* Bak. var. *Faberiana; Athyrium unifurcatum* (*Nephrodium unifurcatum* Bak.), *A. unifurcatum* var. *Harryanum*, *A. sphaeropteroides* (*Polypodium sphaeropteroides* Bak.); *Diplazium japonicum* (Thbg.) Bedd. var. *nudisorum;*

Asplenium lushanense; Pellaea Smithii, P. connectens; Cheilanthes niphobola, C. rosulata; Adiantum venustum Don var. *Smithianum.*—H. Handel-Mazzetti describes the following new species, combinations, and varieties: *Leontopodium roseum, L. conglobatum* (Turcz.), *L. Smithianum* (*L. conglobatum* × *L. leontopodioides*), *L. linearifolium, L. Stoechas, L. haplophylloides,* and *L. gracile* (*L. haplophylloides* × *L. linearifolium*).—The Orchidaceae were elaborated by R. Schlechter who describes the several new species and varieties here listed: *Cypripedilum calciolum, C. nutans, C. Smithii; Orchis diantha, O. spathulata* Rchb. f. var. *Wilsonii; Amitostigma nivale, A. physoceras; Herminium nivale; Neottianthe compacta; Plantanthera minutiflora; Habenaria acianthoides, H. pubicaulis, H. szechuanica; Neottia acuminata, N. dongrergoensis, Listera biflora, L. Smithii, Epipactis monticola; Cephalanthera szechuanica; Goodyera serpens; Pleione Smithii; Oreorchis nana, O. oligantha; Tipularia szechuanica.*—The Cruciferae were studied by O E. Schulz who proposes the following new species and varieties: *Erysimun szechuanense; Cardamine glaphyropoda; Loxostemon Smithii; Hesperis Limprichtii* Schulz var. *violacea; Draba matangensis* and *D. remotiflora.*—H. Andres determined the *Pirolaceae* and described 3 new species, namely: *Pirola szechuanica, P. calliantha;* and *Chimaphila monticola.*—L. Diels in writing up the Iridaceae and Ericaceae describes a single species and variety in the latter family: *Rhododendron daphniflorum,* and *Gaultheria pyroloides* Hook. f. & Thoms. var. *reducta.*—In listing the *Araceae,* K. Krause describes one new species, *Arisaema Smithii.*—*C. E. Kobuski.*

6780. Standley, Paul C. **New plants from Central America.** Jour. Washington [D. C.] Acad. Sci. **15:** 3–9. 1925.—In the course of work recently begun by the author upon a flora of the Panama Canal Zone, new species have been discovered and are described under the following names: *Calathea hirsuta, C. panamensis, Myrosma panamensis, Pleiostachya Pittieri, Aristolochia panamensis, A. sylvicola, Calderonia Klugei, Manettia estrellae, Hamelia Storkii, H. Rowleei, Hoffmannia asclepiadea, H. amplexifolia, H. josefina, H. hamelioides, H. macrophylla, H. leucocarpa,* and *H. pallidiflora.*—*Helen M. Gilkey.*

6781. Sudworth, G. B. **A new hickory from Florida.** Amer. Forests and Forest Life **30:** 334–335. *2 fig.* 1924.—The name *Hicoria Ashei* is proposed for a new hickory discovered by W. W. Ashe in western Florida. The characteristics of this new hickory, which is said to be more or less closely related to the pignuts, are given in detail.—*Chas. H. Otis.*

6782. Wang, Shan Tsuan. **[A new species of Chinese cotton.]** Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] **8:** 77–78. 1923.—A new form of Chinese cotton has been found and described by the author as *Gossypium Nanking* var. *album* Wang. A descriptive key for identifying Chinese cotton plants is also appended.—*Chunjen C. Chen.*

6783. White, C. T. **The Eucalyptus or Gum Trees of the Brisbane District.** Queensland Nat. **4:** 67–72. 1924.—The 22 species of *Eucalyptus* in the area are divided by an analytical key into 5 groups: smooth-barked trees or gums proper, boxes, stringbarks, ironbarks and bloodwoods. This division is based upon cortical characters. Other field characters such as habit, shape of coppice leaves and the color of the wood are also utilized in the subdivision of the groups.—*W. D. Francis.*

REVISIONS AND MONOGRAPHS

6784. Blakely, W. F. **The Loranthaceae of Australia. Part 1.** Proc. Linn. Soc. New South Wales **47:** 1–25. 1922.—The Loranthaceae or Mistletoes, according to Engler's classification, which is followed with slight modifications while making this needed revision of the family, comprised 25 genera and 811 species. Since Engler's work the number has increased and is estimated as upward of about 30 genera and 1000 species. Seven of Engler's genera grow in Australia: *Nuytsia* R. br., *Gaiadendron* G. Don., *Phrygilanthus* Eichl., *Loranthus* L., *Notothixos* Oliver, *Viscum* L., and *Korthalsella* van Tiegh. *Nuytsia* is the only genus strictly Australian. The genera affected by the author's review are *Atkinsonia* which is superceded by *Gaiadendron;* the species of the versatile section of *Loranthus* which are transferred to *Phrygilanthus,* and 2 species of *Viscum* which have been placed in *Korthalsella.* In the genus *Loranthus* it is proposed to restore 5 old species and offer 13 new species and 13 new varieties. This will make a total of 40 species, and 20 varieties or an increase of 21 species and 17 varieties over those published in the "Flora Australiensis" in 1866. They are distributed among the

sections as follows: *Amyema*, 25 spp. 12 vars.; *Diplatia*, 1 sp.; *Treubella*, 4 spp.; *Lysiana*, 4 spp. 6 vars.; *Amylotheca*, 1 sp.; *Dendrophthoe*, 4 spp. 2 vars.; *Benthamina*, 1 sp. These are discussed in detail and enumerated in a later paper. This article gives acknowledgments, brief historical account, chronologically arranged, of important contributions on the *Loranthaceae*, and a discussion of the peculiarities of the family enumerated below. Two characters impressed the author as valuable aids in classification: the inflorescence and the buds both being singularly constant. The venation of the leaves is also valuable as a means of discrimination. The species with parallel venation in *Loranthus*, with one exception, belong to the section *Amyema*, as also do nearly all the terete-leaved species, while those with penninerved leaves, with 1 exception, are in the closely allied sections. In some species the structure of the embryo and its mode of growth and development are useful. The seed of these plants are surrounded by viscin enclosed in a thin membranous sac. They appear to need a fair amount of moisture to insure successful germination and growth, the hypocotyl does not favor strong light, particularly that from the side. Strong traces of chlorophyll—either green or purple pigment—usually occur during germination. The embryo is often green. In many species the cotyledons are not withdrawn from the endosperm but absorb from that position. The vicin may act as a deterrent. They sometimes appear to generate vicin and act as suckers to absorb food until the radicle has established itself. Some seed have a double embryo, frequently the double radicle is unequal and many fail to develop into plants, self-parasitism even may occur. It is held that *Loranthus* has some power of assimilation and is not completely parasitic. The choice of a host appears to be accidental and frequently affected by distribution by birds. The plant is light-loving, and abundant in well-watered country. Two distinct forms of attachment to the host are noted: (1) aggressive or ball-like excrescence of the parasite over the wood of the host, (2) defensive, or fusiform, the penetrating radicle causing the wood of the host to make a ball-like growth. Lists of species with each type are given. Variations in *Loranthus* are attributed to ecological causes rather than mimicry. Australian species are held to be self-pollinated, although nectar-eating birds may assist. It is noted that the style is curved and exceeds the anthers by 2–5 mm. The proximity to the anther, and the powdery nature of the pollen facilitates self-pollination. A list of bird disseminators of seed and also of birds which feed upon nectar is given. Fungi and insects prey upon the *Loranthaceae* as on other plants. The relatively small uses of the family, including those as food for birds, producers of gum used as an adhesive, and of tannin, dyes, and stock food, are pointed out.—*Eloise Gerry.*

6785. Blakely, W. F. **The Loranthaceae of Australia. Part 2.** Proc. Linn. Soc. New South Wales 47: 199–222. *Pl. 27–32.* 1922.—The series *Santales*, subser. *Loranthineae* family Loranthaceae D. Don are described and discussed together with their hosts. A key is given to the subfamilies and tribes the following of which are considered in detail and illustrated: *Loranthoideae—Nuytsieae, N. floribunda R. Br.; Lorantheae—Gaiadendrinae, Gaiadendron* G. Don, section *Atkinsonia* (F.v.M.) Engl., *G. ligustrina* (A. Cunn.) Engler.; *Lorantheae—Loranthinae, Phrygilanthus* Eichler., Section *Muellerina* Engler., *P. eucalyptifolius* (Sieb.) Engler., *P. celastroides* (Sieb.) Eichl., *P. myrtifolius* (A. Cunn. Herb.) Eichl., *P. Bidwillii* (Benth.) Eichl. Key characters for distinguishing the *Viscoideae*, including the *Korthalsellineae* and *Visceae*, are alo given.—*Eloise Gerry.*

FLORISTICS AND PLANT DISTRIBUTION

6786. Almquist, Erik. **Växtgeografiska bidrag. 5. Bohuslän.** [Phytogeographic contributions. 5. Bohuslän, province of Sweden.] Bot. Notiser 1922: 97–102. 1922.—The author gives a list of 133 ferns, fern-allies, and flowering plants with localities. This list contains principally the species which by Lindeberg (Hallands och Bohusläns fanerogamer och ormbunkar, Göteborg, 1878) are not given as "common" or "rather common."—*P. A. Rydberg.*

6787. Burkill, I. H. **Stenomeris in the Malay Peninsula.** Gard. Bull. Straits Settlements 3: 289–290. *1 pl.* 1924.—A description and photographic illustrations are given of a *Stenomeris* of uncertain identity found in the Malay Peninsula. The tubers are of stem nature, and are regarded as resting branches. A brief comparison with *Dioscorea* is made.—*R. E. Holttum.*

6788. Burkill, I. H. **The floras of the Malay Peninsula, Borneo and the Philippine Islands.** Gard. Bull. Straits Settlements 3: 283–289. 1924.—A list is given showing the numbers of species in the various families of Dicotyledones known from the 3 areas. The totals are roughly in the proportion 4:3:5. Marked divergences from this in the individual families are noted.—*R. B. Holttum.*

6789. Cedergren, Gösta R. **Anteckningar till Sveriges adventiv flora. II. Scrophularia Linn.** [Notes on the adventive flora of Sweden.] Bot. Notiser 1922: 1–16. 1922.—The author treats 10 species of *Scrophularia*, provides a key, gives descriptions, area of distribution, localities in Sweden, and more or less extensive notes. Only 2, *S. vernalis* L. and *S. nodosa* L., may be regarded as natives; the others are introduced, *S. chrysantha* Jaub. & Spach and *S. orientalis* L. from Armenia and Caucasus, *S. peregrina* L. from the Mediterranean region, *S. Scopolii* Hoppe from the mountains of central Europe and Asia, *S. scorodonia* L. and *S. auriculata* L. from western Europe and northern Africa, *S. alata* Gilib. from western and southern Europe, and the Orient to the Altai, and *S. canina* L. from the Mediterranean region, southern Russia and Armenia. Literature is cited consisting of 22 references.—*P. A. Rydberg.*

6790. Clute, Willard N. **Prunella vulgaris nana.** Amer. Bot. 30: 169–170. 1924.—A note is given on the widening range of this creeping variety.—*Susan P. Nichols.*

6791. Cowdry, N. H. **Plants from Peitaibo.** Jour. North China Branch Roy. Asiatic Soc. 53: 158–188. 1922.—This annoted list includes the plants observed during the summer of 1919 within a radius of a few miles of Peitaibo. Herbarium specimens of all species cited are in charge of B. E. Read of the Department of Pharmacology, Peking Union Medical College. The list is arranged as follows: I. Spermatophyta (1) Angiospermae (Dicotyledones, Monocotyledones), (2) Gymnospermae; II. Pteridophyta; III. Algae. Each item in the index is followed by the Chinese character and its transliteration.—*Frederick V. Rand.*

6792. Friderichsen, K. **To for Danmark nye Rubi.**[**Two Rubi new to Denmark.**] Bot. Tidsskr. 38: 176–177. 1924.—These species are *Rubus macrophyllus Schlectendallii* Whe. var. *amplificatus* (Lees) Loll., and a form of *Rubus corylifolius* Sm.—*A. L. Bakke.*

6793. Grier, N. M. **Unreported plants from Long Island. I. Pteridophyta and Spermatophyta.** Torreya 24: 71–76. 1924.—A list is presented of 59 species and varieties not previously reported from Long Island, collected by members of staff and students at the Biological Laboratory at Cold Spring Harbor, New York. A bibliography is appended.—*J. C. Nelson.*

6794. Holmberg, Otto R. **Anteckningar till nya Skandinaviska Floran. II.** [**Notes on the new Scandinavian Flora. II.**] Bot. Notiser 1922: 203–209. 1922.—The notes refer to nomenclatorial questions concerning *Cystopteris fragilis* (L.) Bernh., *Struthiopteris Filicastrum* All., *Polystichum aculeatum* (L.) Schott etc. Diagnoses in Latin are given for the following: *Alisma gramineum* subsp. *Wahlenbergii* Holmb., and *f. emersum; Sagittaria sagittifolia* f. *xanthandra;* and *Arctagrostis latifolia* f. *aristata.* There is also added a list of new combinations.—*P. A. Rydberg.*

6795. Kung, Chi Ya. [**List of plants collected in the vicinity of Peking.**] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 8: 68–76. 1923.—Seventy-five plants have been collected at the Temple of Heaven, 41 on the Western Hills, and 57 on the Miao Fung Shan hills by the writer. Each plant is given the name of species and family and also the Chinese equivalent. —*Chunjen C. Chen.*

6796. Lindström, A. **Tillägg till "Marstrandsöns Ormbunkar och Fanerogamer."** [**Appendix to "Ferns and phanerogams of Marstrand Island," Sweden.**] Bot. Notiser 1921: 287–288. 1921.—To the original list given in Bot. Notiser 1920, part 6, there are here added 18 species. Notes are also given on 5 species, of which 3 are probably extinct.—*P. A. Rydberg.*

6797. MacGillivray, W. **An excursion in Southwest Queensland.** Victoria Nat. 41: 103–120. *Pl. 4. 1 map.* 1924.—Considerable data are given regarding the fauna and flora. Plants specially mentioned include: *Trichinium nobile* Lindl., *Blennodia lasiocarpa* F. Muell., *B. nasturtioides* Benth.; *Atriplex vesicarium* Heward; *Eriostemon; Eremophila maculata* F. Muell.; *Grevillea striata* R. Br.—*Wm. Randolph Taylor.*

6798. McMurray, Nell. **Clustered cancer-root.** Amer. Bot. 30: 162–163. 1924.—

The author reports the occurrence of the western plant, *Orobanche fasciculata*, at Clearfield, Pennsylvania.—*Susan P. Nichols.*

6799. Mörner, Carl Th. **Chrysosplenium alternifolium L. var. tetrandrum Lund å relativt sydlig lokal.** [C. alternifolium var. tetrandrum from a relatively southern locality.] Bot. Notiser **1922**: 111–112. 1922.—In Krok & Almquist's Flora the distribution is given as "Torn.Lpm., Norrbotten" [Torne Lappmark, Norrbotten], and in Lindeman's Flora as "n.Lpl." [Northern Lappland]. The former is probably more correct, as Heintze in 1907 gave the following locality: "Norrbotten near Peräjävaara Stage Inn, 2–3 Swedish miles from Pajala." Another locality, south of the Polar circle is now recorded, namely, Över-Torneä Parish, under the northern declivities of Hiirivaara, near Haapakylä village.—*P. A. Rydberg.*

6800. Nichols, G. E. [Rev. of: Cockayne, L. **The vegetation of New Zealand.** *xxiii + 364 p., 65 pl., 13 fig. 2 maps.* Wilhelm Englemann: Leipzig, 1921 (see Bot. Absts. 13, Entry 7583).] Geog. Rev. **14**: 677–678. 1924.

6801. Nowinski, Marjan. **Zapiski florystyczne z południowo-wschodniego krańca kotliny Sandomierskiej.** [Floristic notes on the southwestern part of the Sandomierski basin.] Acta Soc. Bot. Poloniae. **2**: 10–14. 1924.

6802. Ostenfeld, C. H. **Floristiske Middelelser. Smaa Bidrag til den danske Flora VIII.** [Notes on the flora. Brief descriptions of the Danish flora VIII.] Bot. Tidsskr. **38**: 168–176. 1924.—The author lists and describes *Stratiotes aloides* L., *Iris pseudacorus* L. var. *pallidiflava* Sims, *Melica uniflora* Retz. var. *pallida* M. Lorenzen, *Calamagrostis arundinacea* (L.) Roth × *lanceolata* Roth, *Rumex aquatuus* L., *R. odontocarpus* (Sándor) Borb., *Agrimonia eupatoria* L. var. *ochroleuca* Ostf., *Helianthus nummularium* (L.) Mill., *Convolvulus sepium* L., *Amsinckia* sp., *Teucrium scorodonia* L., *Verbascum speciosum* Schrad., *Odontites rubra* Gilib. var. *serotina* Rchb. subvar. *pallida* Lge, *Hieracium umbellatum* L. var. *albescens* Ostf., and *Senecio jacobaea* L. × *maritima* L.—*A. L. Bakke.*

6803. Porterfield, W. M. **The trees and shrubs of St. John's University Campus.** China Jour. Sci. & Arts **1**: 494–499. *3 pl.* 1923.—Preceding the list is a statement concerning the varied mixture of indigenous and exotic species found in Shanghai. Most of the determinations were made by L. H. Bailey. The illustrations are from photographs. The list presents family names, Latin binomials, English common names, and Chinese names both in character and romanization. About 85 species are mentioned. A bibliography of 10 titles is given.—*Albert N. Steward.*

6804. Poulsson, E. **Fortegnelse over Sjursøens bregner og blomsterplanter.** [List of the ferns and flowering plants of Sjursøen.] Nyt Mag. Naturvidensk. [Kristiania] **62**: 52–59. 1924.—Sjursøen is a very small island in the Oslo Fjord, with Silurian formation and a comparatively rich flora. On account of its being destroyed and incorporation in the Oslo harbor extensions, the author has collected his notes on the flora and lists 220 vascular plants.—*K. Münster Strøm.*

6805. White, C. T., and W. D. Francis. **Queensland trees.** Queensland Agric. Jour. **22**: 65–67. *Pl. 23–24.* 1924.—The field characteristics and distribution of *Sideroxylon Pohlmanianum* Benth. & Hook. f. are outlined. The lower part of the stem and herbarium specimens are illustrated by photographs.—*W. D. Francis.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Sam F. Trelease, *Editor*

6806. Anonymous. **Conference for fixing scientific terms in Chinese.** China Jour. Sci. & Arts **1**: 630. 1923.—A conference was held in Shanghai during the month of July, 1923, under the auspices of the Kiangsu Educational Association for the purpose of fixing the Chinese equivalents for scientific terms in medicine, botany, zoology, and mathematics.—*Albert N. Steward.*

6807. Anonymous. **What China needs.** China Jour. Sci. & Arts **1**: 109–111. 1923.—China needs more than anything else the development and conservation of her natural resources. Interest has been awakened in mining and geology, and a like interest is urged

in "museums, biological and chemical laboratories, fishery, forestry, and agricultural experiment stations."—*Albert N. Steward.*

6808. Boyce Thompson Institute. **Organization, equipment, dedication.** Contrib. Boyce Thompson Inst. Plant Res. 1[1]: 1–58. *Fig. 1–12.* 1925.—After detailing the organization and equipment of the Institute the following dedicatory addresses are given: Aims of the Boyce Thompson Institute for Plant Research, by William Crocker, Director; Botanical greetings from Europe, by Vernon H. Blackman; America's need for plant research, by Lewis R. Jones.—These dedicatory addresses were followed by impromptu remarks by Raymond F. Bacon, Raymond Robins, Elmer D. Ball, Robert A. Harper, Lewis Perry, Roscoe W. Thatcher and Jacob G. Lipman.—John M. Coulter presided.—*Frederick V. Rand.*

6809. Sowerby, Arthur de C. **The value of biological research.** China Jour. Sci. & Arts 1: 31–38. 1923.—The benefits of biological research are considered under the following headings: health, economic value, philosophical interest, and educational importance.—*Albert N. Steward.*

6810. Vaughan, T. W. **Oceanography in its relations to other earth sciences.** Jour. Washington [D. C.] Acad. Sci. 14: 307–333. 1924.